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ORIGINAL ARTICLES.

BENEFICENT BY-PRODUCTS OF THE TUBERCULOSIS MOVEMENT.¹

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ON the devastation caused by tuberculosis there is no need to dwell, but just as Robert Burns thought that there might be something to be said even for "Old Nickie-ben," so perchance to the evil spirit of tubercle some beneficent by-product may be credited. I remember in the early days of practice in the North how in the valleys of the Dales enteric fever was rampant and endemic; the farmsteads were foul with stench, vermin, and disease, but the farmers said that a good manure-heap did no one any harm. However, the discovery of the exact causes of typhoidal affections led to a conversion of people who before had turned a deaf ear to all arguments. So it has been in some measure with tubercle; I might as well have argued with one of his bullocks as with the farmer on the intimate causes of this disease also, until the discovery of the tubercle bacillus aroused the public to a sense of the intimate and subtle virulence of germs of disease which could be neither seen nor handled. Tuberculosis, then, has been our schoolmaster to drive into us these truths—a schoolmaster who has chastised us with scorpions indeed, but is now giving hard lessons to those innocents the butcher and the milkman. No less has been the revelations on glanders, and in the war the marvellous results of mallein vaccines—results almost incredible when compared with the

¹ Abstract of an address delivered in connection with a discussion on Tuberculosis before the Royal Society of Medicine.

ravages of the disease in former campaigns. Here the education began with the stable-boys. Thus the lessons of many such diseases are at last persuading the man in the street to listen to the truths and prophecies of science.

Let me now bring before you lesson the second, which is to avoid a rush to the other extreme—namely, an unreasoning cry for “results.” Our campaign against tuberculosis is proving to the layman that, as in the field so in the laboratory, times and seasons are not to be controlled nor reckoned upon. A long cleaning of the land comes first, then after the fallow we have to plough and harrow to make a fine tilth, then to await due weather to sow the seed, then to keep patience during the long dormancy of seed apparently dead in the soil; and then follows many a contingency before harvest is secured. If we are to solve these problems we need capital, time, and patience on the part of those awaiting our results. We cannot be hurried. In the schools maxims can be instilled in some order and with expedition, but discovery, the work of the Universities, cannot be hurried nor produced to time.

The third lesson of our schoolmaster is that, if we are to understand the laws of disease in any one field, we must co-ordinate it with work in other and allied fields of pathology. Every study but medicine has recognized and pursued the comparative method—anatomy, history, religion, law, philology, and so on. Medicine alone fails utterly to see the great work before it in this enlarged realm of research. We shall never understand the diseases of man until we study also side by side with them the diseases of plants and animals. For this reason I welcome cordially to-day the co-operation of our veterinary colleagues. Let us learn that the pathological relations of the humblest animal or plant may serve to throw into light fertile general laws and principles. Every moment of our lives we are dependent for good and evil upon unicellular plants. Who would have supposed that the harvest of herrings could appear to depend upon the changes in the sunspots! Now principles cannot be parcelled out between the several aspects and departments of medicine. Some beginning with comparative pathology we are making by co-operating with our veterinary brethren on this occasion, but it is a small beginning; we need far more than this. Fusion between two fields of medicine so different as theirs and ours is impossible, but co-operation and constant mutual enlightenment on systematic lines is essential if we are to comprehend their work, and they in like manner ours; for evolution is one of the keys to pathology as to biology. It is with the greatest anticipation of such a renewal of medicine that I have heard, on some such lines as these, of the election of a committee of which Sir David Prain is the chairman. This is one of the ameliorations we owe to our harsh and cruel schoolmaster tuberculosis. Specialize we must, especially

in practice; but it is the place and function of the Universities to counteract this narrowness by a wider outlook and by a clear-eyed faith in the results—some ready, some deferred—which we shall gather in if we work together in an endeavour each from our own side to throw cross-lights upon the researches of workers in other departments of medicine. Until we establish Institutes of Comparative Pathology our science and art will lag on the way.

THE VACCINATION OF CATTLE AGAINST TUBERCULOSIS.¹

BY PROFESSOR A. CALMETTE,

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Author of "The Bacillary Infection and Tuberculosis in Man and Animals."

THE great sensibility of cattle to infection by the Koch bacillus of bovine origin is a very favourable medium for the experimental study of the various processes of active immunization against tuberculosis. One must, indeed, admit that this sensibility to infection by the bovine bacillus is at least equal to that of man by the bacillus of human origin, inasmuch as the greater number of animals submitted to permanent domicile in an infected area react positively to tuberculin in the first five years of their existence. If some amongst them escape infection, it is because the duration of their life is greatly shortened for economic reasons. Were they permitted to grow old, all of them would show tuberculous lesions at the time of their natural death. It is, therefore, very interesting to try to discover whether it is possible, by utilizing the young cattle, to confer on these animals a sufficient resistance to the natural infection so that they can, whilst continuing to live in close cohabitation with the adult tuberculous cows, escape the contamination spontaneously produced in the infected stables.

The numerous experiments which have been made during the last twenty years by various investigators have not produced satisfactory results. One remembers Behring's experiments with his method of "Jennerization," which consisted in inoculating young calves twice by the intravenous channel, at a three months' interval, the first inoculation with four milligrammes and the second with twenty milligrammes (dry weight), with a culture of human bacilli. The animals thus treated are found to have only a few months' resistance to the infection by prolonged cohabitation with cattle having open tuberculous lesions,

¹ We are indebted to Dr. D. Barty King for the English translation of Professor Calmette's article, which was sent to us in French.—EDITOR, *B. J. T.*

and a fact still more serious is that for a long time they eliminate in an intermittent manner, through their dejections, and especially by their mammary glands during periods of lactation, tubercle bacilli which keep the form of the human type and would seem to offer very great dangers to man. Other experiments carried out by R. Koch and Schulze with their "Tauruman" (bovine bacilli of enfeebled virulence), and then by S. Arloing with a human bacillus in homogeneous culture, gave the same results.

A number of experiments which I made in collaboration with C. Guérin showed me that to obtain the immunity of the organism to bacillary infections, such as are spontaneously manifested in young people who have been healed of a benign tuberculous infection, it is necessary for this organism to remain parasitized by bacilli, but that these bacilli should not produce follicular lesions or tend to the formation of tubercles.

Thanks to an artificial culture, which consists in growing the bovine bacillus in a number of series of successive generations on a food medium of boiled potatoes in glycerinated bile of beef at 5 per cent., we have arrived at creating a culture of bacilli of very feeble virulence for small laboratory animals, perfectly tolerant to high doses by intravenous injection, and incapable of producing tubercles. It is this biliary (or biled) bacillus, non-tuberculed and lowered to a dose of several milligrammes for the rabbit, guinea-pig, monkey, and man, that we actually utilize for our experiments in the vaccination of young calves.

During the first days after birth, we inject by the venous channel at least twenty milligrammes of a living culture of our bacilli, and leave the young cattle thus treated in intimate contact in the stable with cows suffering from open tuberculous lesions. Up to the present, the conclusions which we have arrived at show first of all, that the biliary (biled) bacilli are well tolerated by the lymphatic organs, that they produce no follicular lesions, and that they determine a manifest resistance, not only to the natural infections by cohabitation, but even to the infections provoked by intravenous experimental inoculation of tested virulent bacilli.

We have not yet come to a decision as to the duration of the resistance; it hardly seems to extend to over a year, and it only persists as long as biliary (biled) bacilli remain in the organism. When these bacilli have disappeared, when they have been eliminated by the natural channels of excretion of the cellular wastes—principally by the bile and the intestines—these animals become again sensible to tuberculous infection, but then vaccination can be renewed without harm. We have repeated it as often as three times in the same animal in three years, and then the resistance of the natural infection has been maintained for an equal lapse of time.

The pursuit of these experiments in the normal condition of the life of the cattle in the stable will show that it is possible to count on this method of vaccination to prevent the animal from contracting tuberculosis in an infected area. For here is the goal that must be attained. If one reaches it by utilizing, as we do, a bacillus non-tuberculinized, innocuous at the same time both to cattle and man, one could hope that an analogous procedure would permit of realizing the immunization of young children, directly after their birth, in such a manner that they could resist the family contamination for the whole period of their existence during which they are more particularly exposed to serious infections which are so often fatal.

Only an experiment on young anthropoid apes, in a region free of tuberculosis—for instance, in a locality on the West Coast of Africa, which is the native habitation of the chimpanzee—can give us the opportunity of verifying this hypothesis. It is therefore urgent to undertake it, and this is what we propose doing as soon as it is possible to gather together the necessary means.

SOME CONSIDERATIONS ON TUBERCULOSIS.¹

By SIR ARTHUR NEWSHOLME,

K.C.B., M.D., F.R.C.P.,

Late Principal Medical Officer of the Local Government Board; Member of the Inter-Departmental Committee on Tuberculosis; Author of "The Prevention of Tuberculosis."

WE know that if the infection of tuberculosis could be eliminated from human life, there would be no tuberculosis. That is the basic fact. No tubercle bacilli, no disease.

Observation on man confirms the results of experimental work on animals to the effect that the amount of disease in an individual is less with smaller doses of infectious material, and that the greater part of mankind, who have been exposed to infection, do not suffer from tuberculosis as a manifest disease. Evidently, therefore, the majority of mankind has a fairly satisfactory degree of immunity against tuberculosis.

At this point a fundamental difference of outlook arises. Is this escape of the majority of infected persons due to inherited qualities, presumably selective in character, or to the fact that most of the

¹ Substance of an address delivered at the Sixteenth Annual Meeting of the National Tuberculosis Association of America.

infected persons receive only minimal doses of infection, incompetent to cause active disease? A further differentiation is needed at this point. It is generally agreed that *in the same individual* resistance to infection is a variable quantity. Under the influence of an acute illness—e.g., measles or influenza—or of prolonged overwork, or anxiety, or alcoholism, or of exposure to irritating dusts, minimal infection may succeed in overcoming natural immunity, and active disease occur. But does variation in dosage of infection *plus* this temporary variation in susceptibility of the individual explain the varying incidence of tuberculosis, or, beyond this, is there evidence of true inheritance of an excessive liability to tuberculosis? All the published evidence pointing to the existence of excessive hereditary proclivity to tuberculosis which I have seen is vitiated by a *petitio principii*, and it is extremely doubtful if evidence on a considerable scale which does not beg the point at issue could be obtained, in view of the oftentimes protracted latency of infection.

There are relatively few families in which no case of recognizable tuberculosis has not occurred. True heredity must, therefore, like familial infection, show itself in an excessive incidence of the disease in certain families. Such excessive incidence is undoubted. But how is true inheritance to be separated from infection, especially in early life? That much, and probably a high proportion, of the infection of human tuberculosis is acquired before puberty is well established. That there will be more opportunities for large-dose infection in a consumptive than in a non-consumptive household is obvious. How, then, shall we differentiate the influence of the hypothetical inherited tendency to become consumptive from the influence of infection in family intercourse?

It has never been done, and "biometrical" statements giving heredity an important place in the causation of human tuberculosis must be regarded as assuming the point to be proved. They sin, furthermore, against the rule in reasoning embodied in Occam's razor: *Entia non sunt multiplicanda præter necessitatem*; in other words, it is an established axiom in logic that multiple explanation is not to be presumed if an adequate single explanation can be given. We know that personal infection from man or a bovine must occur, or there will be no human tuberculosis; we know that in the exceptional instances of tuberculosis in which family predisposition or infection can be eliminated, personal infection suffices to cause disease. The practical conclusion is inevitable; in measuring the relative importance of various activities, we must, until valid facts bearing on hereditary predisposition can be adduced, concentrate on the prevention of infection, intra-familial and extra-familial, and on the removal of those insanitary conditions, whether personal, as malnutrition and overwork,

or non-personal, as injury, exposure to dust and to vitiated air, which in the main are controllable, and in the control of which (a) past experience as regards human tuberculosis, (b) the teaching of pathology, (c) comparative experience in leprosy, and (d) the evidence derivable from the complete control secured in selected herds of cattle over tuberculosis, show that great success can be secured.

In short, excepting in respect of a few well-defined and relatively uncommon diseases, we have little more than the beginnings of a science of heredity of human diseases, and less than this for tuberculosis; and until the biometrician can bring us less doubtful contributions to knowledge, we cannot attach weight to his statements. Even if hereafter it be demonstrated—*e.g.*, by experimentation on animals—that tuberculosis is influenced by hereditary factors, direct attack on environmental factors will remain the chief method of public control of the disease.

The hypothesis that a general elevation of resistance to tuberculosis infection has gradually taken place does not fit in with international experience, for some countries have been experiencing steady reduction (between 1 and 2 per cent. per annum) in their death-rate from tuberculosis, while other countries—also subject to the influence of natural selection—have experienced a stationary or nearly stationary death-rate from this disease. But even if such a gradual increase in immunity has taken place—the alternative hypothesis that there has been gradual reduction in dosage of infection fits better with facts—it is equally our duty to protect our families and the general public against infection to the fullest extent practicable. Efforts in this direction are unlikely to succeed to the extent of preventing the receipt of minimal, and possibly vaccinal, doses of tubercle bacilli; and even were this so—in view of the facts that we are dealing with unproved hypotheses in respect both of natural selection and of immunization by minimal doses of infection—our plain duty is to fulfil the first indication of preventive medicine, *viz.*, to prevent infection by all means in our power.

It is pointed out that between 1870 and 1882 (when Koch announced the discovery of the tubercle bacillus), pulmonary tuberculosis was declining as rapidly as in subsequent years, the implication being that knowledge of communicability and action taken on this knowledge has produced no effect. In actual fact, there has been no rapid change in public education in this respect, and still less in the application of such education to actual precautions on the part of the multitude.

For many years a steady improvement in cleanliness as regards expectoration and in more humane treatment of the sick has been proceeding, and it is no objection to the asserted efficiency of such measures, or to the desirability of their fuller adoption, to state that,

although the tuberculosis death-rate has continued to decline up to the war period—possibly in recent years more slowly—it does not show an increasing rate of decline. Many factors are concerned, and before doubt can fairly be thrown on the usefulness of the precautions against infection which pathology demands, we must assess the weight of those circumstances in modern life which year by year give increasing opportunities for infection. More and more people live in towns, more and more they have indoor instead of outdoor occupations, more and more they have smaller house-room than in the past, and yet the death-rate from tuberculosis, apart from the circumstances of war, has continued to decline. We must have regard to the resultant of all the forces at work, and not assume that because quantitatively results do not come up to expectation these forces are inoperative.

In recent reports to the Medical Research Committee (England), Dr. J. Brownlee has advanced considerations in favour of the views that there are three separate types of human tuberculosis, the origin of which is influenced by different circumstances, and that one of these types—the “young adult” type—is the subject of a long epidemiological wave now on its decline. His report will repay careful study, and his suggestion as to different types of tuberculosis will serve to stimulate reconsideration of accepted views both as to bovine and human tuberculosis, and as to the relative importance of different methods of infection.

The suggested existence of a protracted epidemic cycle of tuberculosis now nearing its end, but with possibilities of future increase, cannot, I think, be disproved or proved. It is an interesting speculation, which leaves us with the present duty of adopting every known measure to control the spread of infection. The same duty was faced in small-pox, plague, and cholera, all of which at irregular intervals, for unknown reasons, tend to take on world-wide travels. Their epidemic cycles outside the country of origin can be, and have been, controlled, and all of these diseases, in civilized communities prepared to face the necessary expenditure in effort and money, are now chained enemies of mankind.

We know that the known measures for the control of tuberculosis, in addition to the success they may achieve in its prevention, will improve the conditions of life and work of the entire population, and will assuage the suffering and ameliorate the lot of tuberculous patients themselves. And, in view of the control obtained over the three diseases just named, notwithstanding the fact that their natural history shows epidemic cycles, may not similar control over tuberculosis be confidently anticipated? Its subjection to the influence of epidemic cycles is extremely doubtful; and, even so, it is a disease in which, owing to the chronicity of attack and the relatively high immunity of man, fractional efforts at prevention can produce corresponding reduction

in disease. In these respects it differs essentially from influenza, in which failure to prevent the spread of infection from a portion of the total cases must necessarily nullify attempts to check the general progress of an epidemic.

In tuberculosis there is no reason to doubt that when public authorities are prepared to take the completely practicable steps for guiding the life of every known consumptive patient in the population, a rapid reduction in this disease can be secured, and that in one or two generations the death-rate from tuberculosis might be reduced to one-half of its present amount.

To adopt to an adequate extent the well-known measures for preventing infection of men by tuberculosis is the only true economy; to refrain from taking them means most extravagant parsimony, with loss of human life and happiness.

TRAINING IN TUBERCULOSIS.

BY PROFESSOR S. LYLE CUMMINS,

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As the newly appointed Professor of Tuberculosis in the University of Wales, I have read the articles published under the above title by Sir Henry Gauvain¹ and Sir German Sims Woodhead² with poignant interest. The responsibility for organizing courses of "training in tuberculosis" is mine at the present moment, and that it is no light one will be readily conceded by readers of the two articles quoted. It is in the hope of clarifying my own ideas rather than of enunciating final opinions that I have accepted the kind invitation of the editor to add a third to his series of articles upon this subject. Before attempting to discuss the lines on which such training should be organized, let us consider for a moment the vast extent of the subject with which we have to deal.

Tuberculosis is a disease which has to be taken into consideration in the "differential diagnosis" of almost every other disease. It is capable of affecting every organ in the body. It can manifest itself in an infinite variety of clinical pictures or lie latent, with never a sign or symptom, until the appointed time. There is hardly any line of inves-

¹ Gauvain, Sir H., "Training in Tuberculosis," *The British Journal of Tuberculosis*, Vol. XV., No. 1, January, 1921, pp. 1-5.

² Woodhead, Sir G., "Training in Tuberculosis," *The British Journal of Tuberculosis*, Vol. XV., No. 2, April, 1921, pp. 54, 55.

tigation applicable to disease in general that is not applicable to tuberculosis. The man who attempts to specialize in this subject finds that it is too large for him. A tuberculosis physician, with a comprehensive knowledge of pulmonary phthisis in all its forms, may find that an ophthalmologist or a laryngologist or radiologist, though claiming no special knowledge of tuberculosis, is his superior when it comes to the detection of some local manifestation of this disease. Or it may happen that at the end of a long career devoted solely to the diagnosis and treatment of consumptives, the tuberculosis specialist may find that a chance discovery of some pathologist or the deductions of a statistician count for more than all his own hard-earned experience.

Where so many different lines of investigation have to be followed, and where such different types of investigators are in the field, it is not to be wondered at that, in the words of Sir German Sims Woodhead, "there has been developed an intolerance and a limitation of outlook, both of which have made against the evolution of any complete system of operations." And yet some such "complete system of operations" is necessary if the elimination of this disease, now proceeding so slowly through the operation of natural laws, is to be furthered by human endeavour. It is towards the evolution of such a system that "training in tuberculosis" should be directed.

The question arises as to how this instruction should be given. At what stage of his career should the student receive this special training? It is clear from what has been said already that no man can be regarded as equipped for the study of this disease without a good general knowledge of medical science. It is for this reason that I am in agreement with Dr. Barty King¹ that "the most opportune time for acquiring a comprehensive and special knowledge of tuberculosis is after graduation." For the undergraduate the best training for future work on tuberculosis lies in close attention to his general medical curriculum. He must become a good all-round doctor before he can hope to specialize in this disease. While it ought to be possible for a professor of tuberculosis to co-operate to a very large extent with the professors of medicine and surgery in providing general instruction upon his own subject for undergraduates, his chief field of utility will, I think, lie in giving post-graduate courses to those who desire to make a special study of this disease with a view to taking it up as a career.

Now that there are so many whole-time appointments in connection with tuberculosis, it is probable that the provision of special courses of instruction would meet a definite want and that opportunities for advanced study would be welcomed by a considerable number of medical men. In this connection, the granting of a *Diploma of Tuber-*

¹ Barty King, D., "Post-Graduate Instruction in Tuberculosis," *The British Journal of Tuberculosis*, Vol. XV., No. 2, April, 1921, pp. 53, 56.

culosis is to be desired, as it would add an inducement for special study, ensure a general improvement of the standard of applicants for whole-time employment and give to those charged with selection for such posts a guarantee that the candidates have devoted time and attention to their subject. On this point I am in entire agreement with Sir Henry Gauvain, and I look forward to seeing the diploma of tuberculosis an accomplished fact before long.

But while the creation of such a diploma is certain to be useful, much more is needed for training in tuberculosis than the mere setting up of a new examination, and the addition of certain letters to the alphabetical glories of the successful candidates. After all, titles and distinctions are, in themselves, of little importance. What really matters is the kind of training that is given to the student during his course.

Let us assume that the regulations governing the granting of diplomas or certificates will exact standards of age, experience, and professional standing, at least equal to those claimed as desirable for tuberculosis physicians in the Interim Report of the Departmental Committee on Tuberculosis (1912). The men that present themselves for training will be, in these circumstances, already well equipped as regards the details of routine clinical diagnosis and treatment. What are we going to teach them? It would seem that we have considerable scope for selection at this point. We have only to consider for a moment the inherent limitations of general medical education to realize that every doctor has a great deal to learn on every subject at every period of his career. The opportunity afforded by, say, six months of post-graduate study devoted to a single disease may be turned to good account in more ways than one. Within the limits of such a period, it might be possible to convert a general practitioner into an incipient "Sanatorium Man," or to make him into a fairly satisfactory technician in laboratory work, or a promising neophyte in the production of artificial pneumothorax. He might have become one, but hardly all, of these things at the moment when he became entitled to his diploma of tuberculosis. And yet, even if we had many such, we should not be much nearer our "complete system of operations."

It seems to me that to get the best out of a course of training in tuberculosis we should concentrate on principles, not on details. The value of such a course lies in preparing the mind of the student so that he may be able to take a wide and intelligent view of the disease to which he proposes to devote his career. It is after the course, when at hand-grips with the practical problems of prevention and cure, that the technical details will best be mastered under the stress of experience and necessity, and it is then that the general training given during the course will come in useful as the basis for practical work.

What we want to get rid of is "the intolerance and limitation of outlook" against which Sir German Sims Woodhead has so eloquently protested. After all, this "intolerance" is not found amongst those who have really counted in the study of tuberculosis in recent times. If we glance at the volumes and articles that have attracted universal attention within, say, the last year, we find that the points of general agreement are much more numerous than the points of difference. Calmette, Borel, Fishberg, Bushnell, Sergeant—what marked unanimity they show on essential points.

If we can only keep to the fundamentals, concentrate on principles rather than details, show that the ward, the laboratory, and the statistical bureau are complementary to each other rather than separate or antagonistic, we may kindle, even during a short course of study, the flame of enthusiastic curiosity that should inspire a life of observation and research.

THE CARE OF TUBERCULOUS CRIPPLES: A PROPOSED SCHEME.

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Its Work and Progress."

SEVEN years' experience of the cases sent for admission to the Liverpool Hospital for Children, Leasowe, leads one to realize that there are many obstacles to be removed before the principles of the scheme for the treatment of crippling defects in children, as outlined by the Chief Medical Officer to the Board of Education, can be brought to fruition.¹ The following are the essential points enumerated by Sir George Newman: (1) That the child should be brought under treatment as early as possible. (2) That treatment should be prolonged sufficiently to obtain the best cure. (3) That after-care must be provided to guard against relapse—a provision most readily effected by arrangement with the School Medical Officer. (4) That suitable educational provision must be provided to stimulate recovery and prevent mental stagnation. It is my intention to discuss some of these points in reference to the existing mechanism for dealing with non-pulmonary tuberculosis, and to suggest a scheme which would overcome the majority of the difficulties.

To ensure that the child is brought under treatment as early as

¹ See Report for 1919, paragraph 164.

possible, it is essential that a knowledge of the disease be possessed by those responsible for making an early diagnosis. This involves, not only a knowledge of the ætiology and general pathology of the disease in its glandular, cutaneous, visceral, osseous, and articular manifestations, but also a grasp of the essential principles of orthopædic practice, for in the osseous and articular lesions it is this knowledge by which alone diagnosis can be made. The spheres of activity of the medical practitioner and the School Medical Officer are the ones in which lie the greatest opportunities and at the same time the greatest responsibilities for recognizing the early signs and symptoms of the disease. Yet it cannot be said with any degree of accuracy that the necessary knowledge is possessed by the majority of those working in these fields. Again, it may be doubted whether this knowledge is possessed by the majority of Tuberculosis Officers in whose hands most often lies the selection of cases for treatment. I do not think that a knowledge of non-pulmonary tuberculosis is ever demanded of candidates for the post of Tuberculosis Officer, and yet about one in five of all cases of tuberculosis notified is a case of non-pulmonary disease. It therefore follows that to ensure early diagnosis teaching must be introduced. It should be included in the curriculum of the medical school, and opportunities given to the student to visit the wards of the special hospital where these cases are treated; also similar facilities for post-graduate study should be offered to the qualified medical practitioner. Moreover, if the duties of the Tuberculosis Officer are to include the care of and selection of the cases for treatment, a knowledge of non-pulmonary tuberculosis and its treatment ought to be possessed by candidates for such posts. The inauguration of a diploma in tuberculosis has been advocated for some time by Sir Henry Gauvain and other writers,¹ the possession of which would be an officially recognized guarantee of efficiency in tuberculosis work.

It would be a forward step if the large cities, boroughs, and county boroughs were to follow the example set by Sheffield and appoint a special officer, the Surgical Tuberculosis Officer or Non-pulmonary Tuberculosis Officer, responsible to the Medical Officer of Health or Chief Tuberculosis Officer for all such cases occurring in his area. His duties should be (1) to see all cases notified at conveniently situated dispensaries, to which dispensary the general practitioner and the School Medical Officer should have free access. (2) His next duty would be to classify the cases according to the treatment required. The classification which suggests itself is as follows: (a) Cases requiring treatment in open-air hospital schools. These are *a priori* the cases of osseous and articular disease requiring prolonged treatment

¹ See articles in *British Journal of Tuberculosis* for January and April of the present year.

in the recumbent position, and the more severe cases of glandular and visceral disease which are confined to bed. (b) Cases requiring treatment in residential open-air schools. These are the less severe cases of glandular, cutaneous, and visceral disease, which require to be kept under medical care, but not being bed cases, do not demand the skilled nursing of those in the former group. Such a school would be much cheaper to run than the hospital school, and its existence would prevent the misuse of the hospital beds. But it would be advantageous to have the two schools on the same estate, in order that cases might be interchanged the one from the other. (c) Cases which may attend open-air day schools situated within a convenient distance from their homes. These are the mild cases of non-pulmonary tuberculosis, which only require periodic medical supervision. (3) According to the claims of administrative duties upon his time, he should have either charge of or access to the hospital and open-air schools. (4) The after-care of all non-pulmonary cases should be his duty, and his alone. I would lay great stress on this, because I have learnt that unless one person is responsible for this very important duty it is apt to be neglected. These cases have to be kept under supervision; they will not voluntarily remain under it, and unless satisfactory after-care results can be shown the work of the Non-pulmonary Tuberculosis Officer should not escape criticism. It is the only guarantee that the money expended on the treatment of this disease is being profitably spent.

In the event of the work of a city, borough, or county borough not being sufficient for a whole-time officer, I would propose that his duties should include the supervision of the care of all other crippling defects in children, since his knowledge of orthopædic principles would qualify him to take charge of this work.

As a result of my experience, I would urge the following points: (1) The introduction of special teaching in the medical schools and facilities for post-graduate study. (2) The inauguration of a diploma in tuberculosis in order that specially trained officers may be available for the work. (3) The centralization of the work for non-pulmonary tuberculosis under one head—namely, the Medical Officer of Health and his Surgical Tuberculosis Officer—as against the multiplication of responsibilities which now exists. (4) The treatment of these cases in special hospital schools and residential open-air schools, as against their reception into the wards of the general hospitals and the convalescent homes. (5) The establishing of after-care clinics and the necessary machinery for following up cases which have undergone treatment, in order that the results obtained from the treatment of this disease may be most effectively checked.

THE FUTURE OF THE SANATORIUM.

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Sanatorium, Benenden, Kent; Author of "Treatment of Tuberculosis
by Means of Spengler's Immune Bodies (I.K. Therapy)."

IT is never possible to speak of the future with certainty, but one can predict with some safety that until a truly specific cure for tuberculosis is found, or until the environment of human beings is more perfect than it is at present, there will be a necessity for sanatoria. In my experience sanatorium treatment is the best method known of raising the resistance to disease in a consumptive patient. Except in acute and advanced cases most patients suffering from pulmonary tuberculosis respond quickly to sanatorium *régime*. This is seen by the gain in energy, improved colour, betterment as regards appetite and sleep, lessened cough, and diminution or disappearance of night sweats, all of which signs and symptoms of improvement are usually noticeable shortly after the patient's admission. The immediate gain in weight is specially noticeable. The average gain in weight of the 270 patients treated in 1919 at the National Sanatorium, Benenden, at the end of their treatment was 10½ lbs., but the average gain in weight at the end of the first two weeks of the treatment in the same cases was 5 lbs. Therefore half of the total weight gained was gained in the first two weeks of treatment; or, put in another way, the statement can be made that in the first one-ninth of the patient's stay at the sanatorium he gained half of the total weight gained during the whole of his period of treatment. Although a gain in weight is not to be taken as a sole criterion of improvement, these facts afford sufficient proof of the immediate response of patients to sanatorium treatment. Unfortunately, on the patient's discharge, there is often an equal response in the opposite direction, and the figures showing the loss of weight in the first few weeks on return to duty might be equally illuminating as to the effect of the absence of sanatorium environment and control, or, in other words, its efficiency while it lasts. The result, however, is that a considerable section of the public is impressed with the relapses and breakdowns that occur amongst ex-sanatorium patients, and considers that sanatoria have failed, but it rather points the way for the future and indicates that the need for the strenuous medical supervision and after-care of each ex-sanatorium patient is paramount, and that the sanatorium of the future must have a closer link with the after-care. This need is being met to a certain extent by the after colony, but it is

doubtful how far this will meet it owing to the vast number of those afflicted. The total need can only be met by better education of the public, by the greater sympathy of employers, and to some degree by the institution of municipal open-air workshops on the lines suggested by Dr. Tinker.

The medical superintendent of the sanatorium is in the best position to judge the patient's capabilities for work on his discharge, and he should be in close touch with the tuberculosis officer to whose care the patient is discharged. At the same time the function of the sanatorium should not be confused with that of the colony. There is a tendency at present to deride the work done by patients at sanatoria and to suggest that all patients therein should be carrying on some useful trade. This is impossible under present circumstances, firstly, because as a rule the period of stay is too short to teach any trade properly, and secondly, because many patients have been carrying on their trades up to the last moment. For the first four weeks of their stay often what is most needed is complete mental and physical rest, and for the next four weeks perhaps short walks only are allowed, which is more beneficial at this period than learning a trade could be. It is, therefore, only during the last few weeks of their residence in a sanatorium that patients are doing work at all equal in extent to that of learning a trade, and this is of course far too short for any really useful educational purpose.

The primary function of a sanatorium is treatment, and it must remain so; and the work done by patients at a sanatorium must continue to be judged as to its efficiency by its effect on the health of the patients and by its effect as treatment. It might be as reasonable to expect all patients in hospitals convalescing from operations to be performing some useful trade. On the other hand, if it is admitted that the main function of a sanatorium is treatment, this is due to the fact that at present most patients stay too short a time. As soon as their oft prescribed twelve weeks are up—and as a result of even this short period they are feeling better and fit to do some work—they desire to leave, thinking they can work as well at home. The general condition responds quickly to treatment, but in so short a time the lung lesion is but little affected. In 260 cases discharged last year, and whose average stay was 17 weeks, the effect of treatment on the local lung lesion was: much improved 18, improved 84, worse 32, unaffected 126. Treatment therefore improved the actual lesion in the lung in less than half the cases. From these figures it is easy to understand how often it happens that shortly after patients leave the tuberculous trouble in the lung flares up again and the general condition rapidly becomes worse. The lesion is often only commencing to heal when the patient is discharged, but by further control under good conditions arrest would be confirmed

and fibrosis and scarring of the lung lesion be made secure. As a sanatorium physician one always feels that if it were possible to retain patients it would enable many of them to keep fit for an indefinite period.

But I admit that if longer treatment is made compulsory at the sanatorium of the future, this further treatment should be on colony lines, so that the sanatorium and colony should be combined in the same institution. By such a combination being a necessary corollary of sanatorium treatment I think the results would be better. It is not at all necessary that the vocations followed by the patients in the colony be the usual open-air employments recommended, but that whenever possible they would continue their usual employment. Owing to the varied occupations of patients this would lead to the sanatorium being the centre of a tuberculous community. A patient could be drafted from one community to another after treatment in the sanatorium of a given community wherever a vacancy for that patient's particular occupation arose in any other community, and there he would require no training but only medical supervision.

In the sanatorium of the future there ought to be greater facilities for original research work. At present medical superintendents are often so overloaded with routine administrative and clinical duties that they have no time for real original work. The sanatorium is in many ways the ideal place for research on tuberculosis because the patients are under continuous and close observation, and the effect of new treatments can be watched, but very few sanatoria are provided with really first-class laboratories. How many medical superintendents have the time to investigate every system of their patients on really scientific lines, or make investigations on immunity problems, metabolism, fatigue, chemical pathology, blood pressure, etc.? Team work at a sanatorium on the lines of the Mayo foundation might reveal many unknown facts relating to tuberculosis. We have no great post-graduate sanatorium school like the Trudeau School of Tuberculosis in America. There is a vast amount of clinical material in sanatoria useful for research and teaching purposes relating to tuberculosis which is not made use of.

This leads to the suggestion that sanatoria must be made more use of for the teaching of medical students in the right principles of treating pulmonary tuberculosis. At a sanatorium they would obtain a clear conception of the effect of rest and exercise on this disease. I am told that the cases of pulmonary tuberculosis treated as in-patients in the great teaching hospitals get fewer and fewer. This may be fortunate for the patients but it is unfortunate for the students, nor can the treatment of tuberculosis be fully taught in dispensaries. It would therefore be of more value for every medical student to attend a sanatorium as an unqualified clinical assistant for twelve weeks and learn how to treat and diagnose tubercle which he will constantly meet with in

practice than to spend his time over testing frogs' muscles or becoming efficient in the diagnosis of some rare diseases which he may never meet with again in all his medical career.

Lastly, the need for children's sanatoria will have to be met. By concentrating our sanatorium efforts on the next generation many potential cases of tuberculosis will be averted from future breakdown. These potential cases are the so-called pretuberculous children who respond rapidly to open air conditions, and by their teaching in the impressionable years of childhood of the value of fresh air they will not only live lives on healthy lines during their own lifetime but will hand on the fresh-air tradition. Education authorities should arrange for all their teachers to visit sanatoria and open-air schools. In that way they would see the effect of open air on child life, and also get a rudimentary knowledge of the early symptoms and signs of tubercle in children. By this knowledge they could bring the children to the notice of the school and family doctor at the earliest stage and much future ill-health due to tubercle might be prevented. To arrest pulmonary tuberculosis in the individual I have indicated that longer treatment is needed than is at present given. Pulmonary tuberculosis is a slow, smouldering, chronic disease, and it is becoming more and more so as the result of the partial immunity of increasing urbanization, and perhaps also as the result of the more frequent and more effective treatment given, but all chronic disease is a chronic expense, therefore let us by provision of children's sanatoria, by securing better homes for the people, by better workshops, and by all other appropriate preventive measures reduce the need for sanatoria in the future.

THE WORK OF A TUBERCULOSIS CARE COMMITTEE.

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HOWEVER complete an anti-tuberculosis scheme may be, it must admittedly be a failure in the absence of some organization to assist patients who cannot remain resident in an institution and whose means are not sufficient to obtain a constant supply of all things needful for the maintenance of their impaired physical powers. While funds derived from municipal rates and Government grants are available for the maintenance of sanatoria, hospitals, and dispensaries, and can be

drawn upon to provide treatment and nursing, they cannot give assistance in many circumstances, and in these cases recourse must be had to voluntary funds, the administration of which is unfettered by rules and regulations. Hence the peculiar value of the services of Care Committees, which have been recognised since the earlier years of the anti-tuberculosis movement, as may be seen from the recommendations of the Interim Report of the Departmental Committee on Tuberculosis.

Reference to past volumes of *THE BRITISH JOURNAL OF TUBERCULOSIS* fails to find much information relating to experience of the working of such bodies, although mention is made of the Boston Association for the Relief and Control of Tuberculosis, by Otis (vol. ii., p. 246); Portsmouth Care Committee, by Mearns Fraser (vol. vi., p. 89); and Cambridgeshire After-Care Association, by Varrier-Jones (vol. xi., p. 21); while an informative paper by Fernandez on Tuberculosis Care Work is to be found in *Tubercle* (vol. i., p. 317). A brief note on the origin and subsequent history of the City of York Tuberculosis Crusade Committee may therefore be of some interest.

The York Tuberculosis Dispensary was opened in December, 1912; beds were provided for sanatorium treatment at the local isolation hospital, Yearsley Bridge, at the County Hospital for surgical cases, and, in addition, a new sanatorium was projected. The need for co-ordination of effort in providing assistance for patients was soon felt, and in consequence the Health Committee invited the York Health and Housing Reform Association, which for many years had been engaged in the furtherance of schemes for the welfare of the citizens, to form a special organization. The Tuberculosis Crusade Committee accordingly came into being in October, 1913, formed not only of representatives of the Corporation and the parent association, but also of all the bodies in the city interested in social work. The Secretary of the Tuberculosis Dispensary, Miss Coning, was appointed Secretary of the new Committee, and has continued to act in that capacity. To her I am indebted for the information contained in this article, which refers specially to the period October, 1913, to December 31, 1920. For the collection of funds recourse has been had to an annual Flower Day, the expenses of which have each year been borne by Mr. Joseph Rowntree; the sums raised total £1,445. These collections have been the chief sources of income.

The whole committee is called together only when important matters have to be settled, the consideration of cases for help being in the hands of a small sub-committee, meeting frequently as required. Reports are received from the Secretary as to financial position of cases to be considered, while the Tuberculosis Officer supplies necessary information from the medical and hygienic standpoints. Frequently some of the members make themselves acquainted with the facts of the

case from personal inquiry, this being a valuable stimulus towards interest in the work and leading to most helpful decisions as to the nature and amount of the assistance to be granted.

I cannot do better than state the objects with which the Committee set to work, and which they have steadily kept in view since: 1, Provisional help for patients in need of immediate assistance; 2, Extra nourishment; 3, Friendly visiting and advice; 4, Maintenance of patients while under treatment until able to work; 5, Provision of separate beds, so that patients may sleep alone; 6, Assistance with housework or washing while patient is in a sanatorium; 7, Provision of deck-chairs; 8, Payment of removal expenses; 9, Payment towards rent of larger house to effect isolation of patient; 10, Provision of warm clothing; 11, Expenses of boarding out in the country; 12, Letters for convalescent homes, hospital, etc.; 13, Provision of shelters; 14, Assistance towards cost of training for more suitable work.

Though restricted by lack of funds, much on the lines of this programme has been accomplished. For the past two years the City Council has voted £50 per annum for extra nourishment (chiefly milk), and this has been administered by the Care Committee. During the years 1914-20, 306 patients have been thus assisted. Another part of the work has been the boarding out, in the country or in convalescent homes, of children, and a smaller number of adults, mostly contacts (173 in all), either suspects or those in whom, owing to lowered resistance, infection was to be feared. Part or the whole of the charges, according to the family circumstances, were borne by the Committee, and except in 21 specially necessitous cases the relatives paid small sums weekly towards the cost. Good results have been obtained from this preventive measure, and very few of the individuals have developed active tuberculosis.

It is worthy of consideration whether it would not be true economy to prevent the development of active tuberculosis on these lines, rather than for the State to expend vast sums on sanatoria, training colonies, and village settlements for those in whom the disease is established. So far this view does not seem to have appealed to the Ministry of Health, and no grants are available for such purposes.

A much appreciated benefit has been the supply of 487 hospital, maternity home, and general dispensary tickets to the families of sufferers, and to others met with in the course of dispensary work. Sick-room appliances, beds and bedding in 190, shelters in 41, clothing in 58, and night nurses in 3 cases, were provided. Financial assistance was granted in 37 instances, loans in 4, help towards rent in 12, while 8 patients had artificial dentures, and 4 artificial limbs supplied. Suitable employment or training was found for many ex-patients, and

some were directly employed—men in carpentry work (instructor and materials provided), women in sewing. Sales of work done have partially recouped the Committee for their expenditure on these heads.

With the demands for State and municipal economy so insistent, and public generosity diminished by the increased cost of living and high taxation, the times are difficult for such undertakings, and the scope of their enterprises must be a restricted one, but I submit that what has already been accomplished proves that, with more adequate funds at their disposal, Tuberculosis Care Committees can play a most important rôle in the campaign against the disease.

ASSOCIATIONS AND INSTITUTIONS.

INTERNATIONAL UNION AGAINST
TUBERCULOSIS.

THE next International Conference on Tuberculosis will be held in London, at the Institution of Civil Engineers, Westminster, from Tuesday, July 26, to Thursday, July 28 inclusive. The National Association, which represents Great Britain and Ireland on the Council of the International Union against Tuberculosis, has decided to merge its Annual Conference in the International Meeting, and will act as host. The International Union against Tuberculosis is the lineal continuation of the International Tuberculosis Conference which, up to 1913, assembled annually in one or other of the Capitals of Europe or America. The purpose of the International Union is to achieve an effective combination of the nations of the world against Tuberculosis. This gathering of representatives from all countries affords an opportunity for an interchange of views regarding all matters relating to the prevalence, prevention, and arrest of Tuberculosis. The London Conference will be open to members of the International Union against Tuberculosis, and to official delegates from countries within the League of Nations and from the United States of America, and to representatives from all authorities interested in the important subject with which the Conference is concerned. The President of the International Union for the current year is M. Léon Bourgeois, President of the French Senate, who will be succeeded on the occasion of the Conference in London by Sir Robert Philip, M.D., Professor of Tuberculosis in the University of Edinburgh. The Conference will be welcomed to London on behalf of H.M. Government by the Right Hon. Earl Curzon of Kedleston, K.G., Secretary of State for Foreign Affairs; and Sir Alfred Mond, Minister of Health, will attend and speak on behalf of the Ministry. Addresses will be given at the Opening Meeting of the Conference by M. Léon Bourgeois and Colonel George Bushnell of the United States Army Medical Corps. The subjects for discussion are: (1) "The Modes of Diffusion of Tuberculosis throughout the Races of the World," opened by Professor Calmette of the Pasteur Institute, Paris. The subject will be considered under the following heads: (a) Frequency of tuberculosis among civilized people; and its rarity among savage or nomadic races. (b) Number of persons infected at different ages of life in crowded centres and in rural areas. (c) Sources of tuberculous infection—expectoration, discharging tuberculous lesions, tuberculous milk. (d) Contagiousness of latent tuberculous lesions. Discharge of bacilli by natural excretory channels (intestine, kidney, mammary gland). (e) Dissemination of tuberculous infection by apparently healthy T.B. carriers. Preventive measures against the spread of infection. (2) "The Rôle of the Medical Profession in the Prevention of Tuberculosis," opened by Sir Humphry Rolleston, K.C.B., M.D., F.R.C.P., and followed by Sir George Newman, K.C.B., M.D., F.R.C.P., F.R.S.E., Chief Medical Officer of the Ministry of Health and Board of Education.

NOTICES OF BOOKS.

TUBERCULOSIS AND INDUSTRIAL HYGIENE.

THE new work on the health of the industrial worker, prepared by Professor E. L. Collis and Dr. Major Greenwood, is one which deserves the study of all who are striving for the prevention and arrest of tuberculosis.¹ It is an informing, suggestive, and thoroughly practical treatise on the general hygiene of industry. The volume opens with a valuable historical retrospect of the relationship of industrial conditions and health, and this is followed by a review of legislation. Then come two able chapters on the Utilization of Statistical Methods in Industrial Preventive Medicine and the Effects of Industrial Employment upon Health as indicated by Vital Statistics. There are separate chapters on Industrial Activity and Fatigue, Cancer and Industry, Causation and Prevention of Accidents, Industrial Employment of Women, the Feeding of the Industrial Worker, Food at the Factory, and the Use of Alcoholic Beverages by the Industrial Worker. There are also practical chapters on Reasons for and Methods of Ventilation, Lighting, Washing and other Sanitary Accommodation, Labour Turn-over or Industrial Wastage, Supervision of Industrial Health, and Reclamation of the Disabled. Readers of this journal will be specially interested in the careful study of tuberculosis and industry. Here is provided a particularly thoughtful presentation of the best results of reliable investigations on the Epidemiology of Tuberculosis, and the following conclusions are arrived at: "Looking at the country as a whole and the changes which have taken place during the last fifty years, a period in which steadily increasing industrialization and its associated effect of aggregation within urban areas has been accompanied with improvements of general sanitation, we find that the death toll of tuberculosis has diminished in both sexes, but has diminished faster among women than amongst men. Where we make synchronous comparisons of urban and rural districts—whether the mass comparison of counties mainly urban with counties mainly rural without correction for deaths of non-residents, or the more detailed comparison possible after 1911—we find that, with advancing age, the disadvantage of the town dwellers increases, and that the apparent advantage of young female city inhabitants can be accounted for more or less completely by immigration from the country of healthy females. At ages over thirty-five in both sexes the town dwellers die from phthisis at a much greater rate than the denizens of rural districts, but the excess is far greater amongst males than amongst females. The excess is most at the age-periods of life at which the largest proportion of urban males

¹ "The Health of the Industrial Worker," by Edgar L. Collis, M.A., M.D., M.R.C.P., Mansel Talbot, Professor of Preventive Medicine, Welsh National School of Medicine, etc., and Major Greenwood, M.R.C.P., M.R.C.S., Member of Industrial Fatigue Research Board, etc. Containing a Chapter on Reclamation of the Disabled, by Arthur J. Collis, M.A., M.D., M.R.C.S., D.P.H.. With an Introduction by Sir George Newman, K.C.B., D.C.L., M.D., F.R.C.P. Pp. xix + 450. With 38 figures and tables. London: J. and A. Churchill, 7, Great Marlborough Street, W. 1921. Price 30s. net.

are industrially employed, and the smallest proportion of urban females—the age of married life. Hence we surmise that industrial employment is a great factor in producing the difference. In support of this we find that in great industries, such as printing and shoemaking, necessarily associated with urbanization, the death-rate from phthisis is extremely high, higher than is to be expected from the death-rate due to other causes sustained by the members of the trade, and therefore can hardly be attributed to a generally low standard of physique attained by them. Whether the deleterious influence of industry is direct and a result of factory-produced infection, or indirect, has been investigated by comparing the correlative between tuberculosis rates and indices of employment and of home environment in the two sexes for the Metropolis. The result has been to show that, during the period of life when male industrial employment is at or near a maximum, and female industrial employment at an absolute minimum, the period in which the greatest proportion of living persons are married, the index of bad home conditions varies closely with the male death rate from tuberculosis. From this the inference is drawn that the deleterious influence of factory life acts through the home environment. The males, whose vitality is lowered by factory conditions, become more susceptible to evils associated with the home itself; amongst women the factor of varying home conditions is less directly associated with variation of the tuberculosis death rate, which in them seems most closely correlated with the death rate from other causes than tuberculosis. Lastly, there is reason to believe that a full epidemiological analysis may involve the separation of the clinical entity phthisis into three types characterized by differences of age susceptibility, and, perhaps, differences in responsiveness to good or bad environmental conditions. Both the inferences as to the differential effect of home conditions and the epidemiological subdivision of phthisis are not yet to be accepted as proven; much more statistical work is needed thoroughly to test them.” And after this judicial expression of views with its concluding words of warning and plea for further investigation, the authors ask this question: “In the light of what we do know, or more or less shrewdly guess, as to the essential epidemiology of phthisis, what are the practical measures to be taken to mitigate its ravages?” The answer is as follows: “Upon balance it appears that the general belief of our fathers and grandfathers is sound, and the policy which ought to have been, and to some extent was, inspired by that belief is a sound policy. What is the matter with the poor is largely poverty. Not through any special intensive measures of campaigning against the tubercle bacillus, not even by the segregation of the actively tuberculous, does there seem any real hope of salvation. We have to improve the homes of the working classes in the first place—it is a sound, popular instinct that inspires the popular outcry against urban and even rural housing conditions; in the second place, we have to ensure better factory conditions; here it is not so much sanitation in the popular sense as hygiene in the wider apprehension of the term. We require regulation of the hours and intensity of work, of the physical characters of the atmosphere, and of the quantity and quality of the meals taken, so that the workman returning home shall not reach it in a condition of definitely lowered resistance to an infection which must still be regarded as ubiquitous.”

We would particularly commend the section on Prevention, Detection, and Treatment of Tuberculosis in Relation to Industry, for it contains much which will be found of practical service. The whole work is epoch-marking, and not only points to a new development in the Science and Art of Preventive Medicine in Relation to Industry, but will go far to stimulate fresh investigations and progressive practical endeavours. As a work of reference the volume is indispensable: at the end of each chapter is a representative bibliography.

TUBERCULOSIS AND PREVENTIVE MEDICINE.

Professor R. T. Hewlett and Dr. A. T. Nankivell have produced a suggestive, informing, and thoroughly practical manual on the principles and practice of preventive medicine in so far as the subject concerns the medical student and the general medical practitioner.¹ The authors have in great measure followed the scheme outlined by Sir George Newman in his well-known publication, "Some Notes on Medical Education in England." The work deals with our English system of local government as it relates to health and disease, eugenics and maternity, infant mortality and the medical care of infancy, the welfare of young children, the health of school-children, adolescents and adults, the healthy dwelling-house and overcrowding, the housing problem, food and the food supply, milk and milk products, alcohol and alcoholism, water supply and the public health, infection and infectious diseases, preventive inoculation and disinfection, statistical methods and vital statistics, etc. There is an excellent presentation of the essentials of the tuberculosis problem. "No less than 73,654 cases of pulmonary tuberculosis and 22,096 cases of other forms of tuberculosis were notified to the various health departments in England and Wales by practitioners during the year 1917; and in that year there were 43,113 deaths from acute or chronic phthisis, and 12,821 deaths from other forms of tuberculosis, giving a grand total of 55,934 deaths from this cause. Tuberculosis is a preventible disease, but it is obvious from these figures that its occurrence has not been prevented. As a cause of death, however, tuberculosis is declining in importance; the diminution in the amount of death from this infection began before the inception of any serious hygienic efforts for the control of the disease. In the five years ending 1880 the death-rate from phthisis was 2,040 per million living; in the period ending 1885 it was 1,830 per million; 1,635 in 1890; 1,462 in 1895; 1,322 for the five years ending in 1900; and 1,239 in the year 1917 per million persons living. An appreciable improvement, therefore, has been made in the mortality rate; but the science of preventive medicine will not remain satisfied until tuberculosis has become as rare as leprosy is to-day." The causal factors are carefully considered, and methods and agencies now in favour for securing the prevention of tuberculosis are discussed. With regard to the rôle of the tuberculosis colony the following statement is made: "The person who has suffered from phthisis needs prolonged after-care, and this could very well be given in some healthy

¹ "The Principles of Preventive Medicine." By R. Tanner Hewlett, M.D., F.R.C.P., D.P.H., Professor of Bacteriology in the University of London, and A. T. Nankivell, M.D., D.P.H. Pp. viii + 536. London: J. and A. Churchill, 1921. Price 21s. net.

colony, where, with his relatives or family, he might earn his living in a healthy manner among healthy surroundings, and live in a healthy house away from the dust and smoke and infection of a great city, and apart from the evils of the factory system." We have no hesitation in warmly commending this reliable, up-to-date, and attractively written manual to the attention of those for whom it has been specially prepared.

MANUALS FOR MEDICAL ADVISERS AND WORKS OF REFERENCE.

X rays have abundantly proved their value in almost all departments of medical work, and both in the diagnosis and treatment of tuberculosis they now occupy a firmly established position. The recently issued manual on the use of X rays in general practice, written by Drs. Alice Vance Knox and Robert Knox, is just the volume needed by many students and practitioners as an introduction to X-ray work.¹ The volume is a member of the excellent "Edinburgh Medical Series," edited by Dr. John D. Comrie. The principles and practice of radiography and radiotherapy are set forth in a series of well-arranged chapters, each a model of lucid, serviceable presentation. The book is an admirable exposition of the sphere of usefulness of this comparatively new physical agent in dealing with human bodily disorders, and practitioners only need to read these pages to appreciate the guidance afforded. The value of X rays in diagnosing ultrathoracic tuberculosis is indicated: "X rays are, after all, only another method of inspection, and the value must always depend upon the experience of the observer in recognizing early departures from the normal in the screen examinations and in the negatives. When a first-class plate is obtained, very early changes may be appreciated, and in screening variations in the movements of the diaphragm and other changes may give the clue to the presence of disease. Such X-ray evidence, when considered together with the early physical signs, the history, and the result of bacteriological and other tests, may add the final weight which turns the scale to the diagnosis of tubercle." The advantage of X rays for dealing with many cases of tuberculous glands is also explained. There is an excellent radiogram of tuberculosis of the wrist. As may be expected, the publishers have produced the work in first-class form.

We are glad to welcome a second edition of the fine textbook of General Pathology, which bears the names of Prof. J. M. Beattie and Dr. W. E. Carnegie Dickson.² It is a model work for students, and one which all practitioners desirous of keeping up-to-date in pathological progress will be wise to procure and study. The publishers have

¹ "General Practice and X Rays: A Handbook for the General Practitioner and Student." By Alice Vance Knox, M.B., B.Ch. With chapters on the Production of X Rays and Instrumentation by Robert Knox, M.D., C.M., M.R.C.S., L.R.C.P. Pp. xiv + 214, and xxxii. plates and 56 figs. London: A. and C. Black, Ltd., 4-6, Soho Square, W. 1. 1921.

² "A Textbook of General Pathology for the Use of Students and Practitioners." By J. Martin Beattie, M.A., M.D., M.R.C.S., L.R.C.P., Professor of Bacteriology, University of Liverpool, etc., and W. E. Carnegie Dickson, M.D., B.Sc., F.R.C.P.E., Director of the Pathological Department, Royal Hospital for Chest Diseases, London, etc. Second edition. Pp. xlv + 496, with 233 illustrations in the text and 13 coloured plates from original preparations. London: William Heinemann (Medical Books), Ltd., 20, Bedford Street, W.C. 2. 1921. Price 31s. 6d. net.

produced the book in a worthy form: it is excellently printed on good paper, and is lavishly illustrated, the plates being admirable examples of high-class colour printing. The volume is based on the teaching of the Edinburgh School. The fundamentals of pathology are lucidly presented in a form which every student of the subject will appreciate. There is a particularly excellent section on Animal Parasites, and many will be grateful for the effective exposition provided regarding immunity. Tuberculosis is dealt with in a concise and serviceable manner, and there are a number of instructive photo-micrographs. We strongly recommend this handsome and workmanlike production to all who desire a manageable, up-to-date, and really helpful introduction to the basal facts of modern medicine. It is one of the very best of existing textbooks on General Pathology, and eminently suited to meet the needs of the hard-worked student and busy practitioner.

Deprivative diseases and the importance of vitamins and other food accessories are subjects which now demand the consideration of all clinicians, and are of particular interest to tuberculosis officers and other advisers dealing with children and responsible for the instruction of the public in affairs relating to the preservation of health. To all such, Professor A. F. Hess's monograph on scurvy will be of special value.¹ The Preface contains the following: "The world war has tended to demand a renewed consideration of scurvy. This disorder has played a rôle in all wars—in the campaigns of the Cæsars, the pilgrimages of the Crusaders, and the numerous wars of the last century. In the recent war it existed among the various armies, particularly those in the East, to an extent greater than at first was realized. In Mesopotamia it is stated to have been one of the decisive factors in forcing the surrender of the British at Kut. Its incidence, however, was not limited to the military forces. Reports from England and the continental countries clearly indicate that scurvy prevailed among the civilian population during the past few years to a degree unknown in peace times. This was especially true of infants and children." Dr. Hess, in his exceptionally able and very complete monograph, provides a reliable and thoroughly up-to-date history of scurvy. He discusses pathogenesis and etiology, pathology, symptomatology, diagnosis, prognosis, and treatment in detail. The work also contains much matter relating to modern views on metabolism, and the nature and rôle of the antiscorbutic vitamin. Medical superintendents responsible for the dietary of the subjects of tuberculosis and other diseases will find in this fascinating volume much that will be of practical service. There is an excellent bibliography.

Sir Thomas Horder has issued in attractive pocket-book form reproductions of his aphorisms and clinical notes which have recently appeared in *St. Bartholomew's Hospital Journal* and *The Practitioner*, and every practitioner should make a point of securing a copy of this truly companionable little volume.² Every clinician will appreciate it.

¹ "Scurvy, Past and Present." By Alfred F. Hess, M.D., Clinical Professor of Pediatrics, University and Bellevue Hospital Medical College, New York City. Pp. vii + 279, with 25 illustrations and 6 tables. London and Philadelphia: J. B. Lippincott Company. 1920. Price 18s.

² "Medical Notes." By Sir Thomas Horder, M.D., F.R.C.P., Physician with charge of out-patients to St. Bartholomew's Hospital. Pp. xi + 112. London: Henry Frowde, Oxford University Press; and Hodder and Stoughton, 20, Warwick Square, E.C. 4. 1921. Price 6s. net.

The work is appropriately dedicated to the author's old teacher, Samuel Gee, and evidently the cloak of the master has fallen on a true disciple's shoulders. The "Notes" are grouped under sixteen headings, and deal with a wide range of clinical subjects, all of practical importance. We venture to reproduce certain of the directing statements which appear in the section "On Pulmonary Tuberculosis." "Asymmetry in the physical signs elicited on examination of the chest does not always indicate disease. . . . In phthisis the extent of the disease is generally greater than the signs indicate, and its duration has been longer than the patient thinks. . . . Tubercle bacilli are rarely demonstrable in the blood of hæmoptysis in early phthisis. . . . However 'obvious' a case of phthisis may be, examine the sputa." There are also useful notes on the anatomical types of pulmonary tuberculosis, signs of cavity, stages at which hæmoptysis occurs, diseases in which phthisis is often latent, family types, and the individual factor in treatment. The following are the wise remarks on the importance of securing the patient's co-operation: "Some of the most difficult patients to help are those who leave the whole burden of the treatment to the doctor, and themselves evince complete inertia. It is true that in a few cases, despite this attitude, things go well, but in many more cases such an attitude spells failure, and patients should be warned against it at the beginning of their treatment. It should be explained to them that in order to regain health, and to keep it, they must make the business of their cure a matter of hard work over a lengthy period, just as they would make any other goal that is worth reaching a matter of concentrated effort under expert guidance."

In the fight with tuberculosis good nurses and scientifically conducted nursing are essential for success. Sufficient attention is not being devoted to this matter. We therefore gladly welcome the appearance of a comprehensive history of nursing, prepared by Miss Lavinia L. Dock, in collaboration with Miss Isabel Maitland Stewart, and based on the well-known four-volume "History of Nursing," written by Miss Dock in collaboration with Miss Nutting.¹ This practical volume is a fascinating record of the evolution of nursing and its establishment in Britain, America, and other progressive countries on scientific and humanitarian lines. It is a book which every doctor and all lovers of good work in the interest of suffering mankind should read with enthusiasm. Interesting references are made to the development of the service of tuberculosis nurses. "It has often been said that the value of the nurse as a teacher of hygiene and sanitation was first recognized and used systematically by the leaders of the anti-tuberculosis crusade. This movement relied mainly on popular instruction, publicity, and the community spirit to accomplish its purpose. So much close individual teaching was needed, the whole mass of tuberculosis was so much greater than had been known, and the personal difficulties were so great, that the help of nurses was quickly found to be indispensable. The antituberculosis movement emphasized instruction, and rightly so. Its vast proportions, however, made

¹ "A Short History of Nursing from the Earliest Times to the Present Day." By Lavinia L. Dock, R.N., Secretary, International Council of Nurses. In collaboration with Isabel Maitland Stewart, A.M., R.N., Assistant Professor, Department of Nursing and Health, Teachers' College, Columbia University, New York. Pp. vi+392. New York and London: G. P. Putnam's Sons. 1920. Price 17s. 6d. net.

it too often impossible for the nurse to do anything *except* instruct. A danger lay here, which the visiting nurse proper—she who observed as closely as possible the standards of the best private duty nursing care in her handwork with the sick—deplored, but it remained in the structure of much of the work with tuberculosis. Teaching alone has not the same magnetic power as *teaching* and *doing* when effectively combined."

We are particularly anxious to direct the attention of tuberculosis officers to Mr. Morley Roberts's remarkable volume on "Warfare in the Human Body."¹ It is a work of genius. The author is known to many as a brilliant journalist and novelist. He is not a medical man, but has studied life in many parts of the world, and, as his latest book abundantly testifies, he is not only a scientific observer of rare powers, but a profound and original thinker. Every doctor and student of human pathology should study Mr. Roberts's collection of illuminating and thought-compelling essays. It is impossible within the limits of a paragraph to do justice to this epoch-making work—this revelation of some of the secrets of life, disease, and death, all expressed with the art of one skilled in literary presentation. Truly, as Professor Keith so aptly expresses it: "In these essays he has earned for himself the freedom of the City of Realities or Science." There are eleven separate contributions in addition to the author's Preface and Appendices, and something of the scope of the volume will be indicated by an enumeration of titles: Method in Science, Malignancy, Repair in Evolution, Inhibition and the Cardiac Vagus, The Theory of Immunity, The Cannibal in Evolution, Heredity and Environment, The Origin of Therapeutic Bathing, The Physiology of Consciousness, The Psychology of Training and Organization, and The Pharmakos and Medicine. We venture on one quotation which is highly suggestive, and merits the consideration of readers of this journal: "There still remains much work to be done as to the indirect influences of diseases, infectious and otherwise, upon physical and cerebral development. It may be suggested that the acuity of sensation and perception of those affected, but not disabled, by tuberculosis, and the slow acquisition of immunity, may have modified human character to a marked degree."

Germany in pre-war days occupied a foremost place in providing opportunities for research in regard to various aspects of the tuberculosis problem. German literature relating to tuberculosis has always been conspicuous. And now in these post-war days Germany is again devoting special study to the consideration of tuberculosis. We have received several monographs from the well-known firm of Curt Kabitzsch of Leipzig, which call for brief reference in this journal.

Professor Dr. Gräfin von Linden has issued a volume consisting mainly of articles written between the years 1912 and 1920, and published in the *Beiträge zur Klinik der Tuberkulose*.² These deal with the

¹ "Warfare in the Human Body: Essays on Method, Malignity, Repair, and Allied Subjects." By Morley Roberts. With an Introduction by Professor Arthur Keith, M.D., F.R.C.S., F.R.S., etc. Pp. xii+286. London: Eveleigh Nash Company, Ltd. 1920. Price 18s. net.

² "Experimentalforschungen zur Chemotherapie der Tuberkulose mit Kupfer- und Methylenblausalzen." Ausgeführt mit Unterstützung des Königlich Preussischen Ministeriums des Innern und der Lupuskommission des deutschen Zentralkomitees zur Bekämpfung der Tuberkulose. Von Professor Dr. Gräfin von Linden. Vorst. des parasitol. Laboratoriums der Universität Bonn. 8s. vii+286 mit 1 Ab.

action of various salts of methylene blue and of copper on the tubercle bacillus *in vivo* and *in vitro*. The greater part of the work is taken up with accounts of exhaustive experiments to determine the action of these substances on cultures of the tubercle bacillus as well as on infected guinea-pigs; this section is copiously illustrated by coloured and other plates. The remaining and much shorter section deals with the treatment of skin, osseous, joint, uro-genital, and pulmonary forms of tuberculosis in man, and will be of general interest to tuberculosis officers and other clinicians. The author concludes that, while copper salts give good results in chronic and sub-acute cases (whether afebrile, subfebrile, or slightly febrile), their administration in cases of long-standing fibroid phthisis is of doubtful value, while in acute progressive disease they are of no use at all. The results obtained with methylene blue do not appear to have been very conclusive. The whole book is a monument of careful and painstaking research, which should be of special value to workers on chemotherapy. A bibliography is appended, containing upwards of one hundred references.

Dr. Tideström has also issued a volume supplementary to the *Beiträge zur Klinik der Tuberkulose und spezifischen Tuberkulose-Forschung*.¹ It has been published under the general editorship of Professor Ludolph Brauer, and deals with the pneumothorax treatment of pulmonary tuberculosis. The author, who states that in spite of the extensive literature on the subject very few large series of cases are dealt with, gives details of fifty-six cases admitted to the Säfsjö Sanatorium in Sweden between November, 1910, and December, 1913, in whom artificial pneumothorax had been induced, and who had been under observation up till the time the monograph was written (December, 1918)—*i.e.*, during a period of from five to eight years. The greater part of the book is devoted to a description of the cases, their clinical history and details of treatment being given in full; while the remaining section is devoted to a discussion of technique, indications and contra-indications, and complications associated with the procedure. A short bibliography of the subject is appended, the references being apparently confined to German and Scandinavian authorities. The volume contains reproductions of X-ray photographs of seven of the cases taken at various intervals during and after the treatment.

Heliotherapy has now fully justified its position as a valuable means for dealing with various forms of tuberculous trouble. Those making use of this method will find much that will interest them in Dr. Liebe's monograph on the use of heliotherapy in German sanatoria.²

bidlung im Text und 74 Tafeln. Leipzig: Verlag von Curt Kabitzsch. 1920. Ladenpreis: brosch. M. 126; geb. M. 111.

¹ *Beiträge zur Klinik der Tuberkulose und Spezifischen Tuberkulose-Forschung*. IX. Supplementband: "Beitrag zur Kenntnis von der Behandlung der Lungentuberkulose mit künstlichem Pneumothorax." Von HJ. Tideström, leitender Arzt des Eksjö-Sanatorium (Sweden). Ss. 100 mit 7 Tafeln. Leipzig: Verlag von Curt Kabitzsch. 1920. Ladenpreis: brosch. M. 24.

² "Die Lichtbehandlung (Heliotherapie) in den deutschen Lungenheilstätten." Denkschrift auf Veranlassung der Vereinigung der Lungenheilstättenärzte bearbeitet von Sanitätsrat Dr. Georg Liebe (Waldhof-Eigershausen). Mit einem Geleitwort von Ministerialdirektor Professor Dr. Kirchner und mit Beiträgen von Professor Dr. Baemeister in St. Blasien, Dr. Bochallı und Dr. Scheffer in Lostau und vielen deutschen Heilstättenärzten. Ss. 61 mit 2 Abbildungen im Text. Leipzig: Verlag von Curt Kabitzsch. 1921.

We have also received copies of several other German works which may interest our readers, and we therefore make reference to them in the footnote below.¹

In our last issue we noticed Dr. Gammons's excellent manual on "Practical Tuberculosis." The American issue was the one before us then, published by C. V. Mosby Company; but we have now received an English edition, which we commend to the notice of general practitioners in this country.²

The Minister of Public Works and Mines at Halifax, Nova Scotia, has issued an eminently practical manual for the use of tuberculous patients and those who want to help them.³ The authors quote Dr. Allen K. Krause: "For any programme to be even measurably successful we must bring about a thorough vulgarization of our knowledge of tuberculosis. The truth must be told and the remedies must be made common knowledge. . . . Our leaders in tuberculosis must lay aside their scruples, come down to true and effective simples, and become lay preachers through the press." This advice is certainly carried out with success in this timely handbook. It is full of helpful information and provides much reliable advice in a form which any man or woman should understand and be willing to act upon. We commend this unpretentious little work to the notice of tuberculosis officers and others on whom devolve educational duties in instructing patients and members of the community in principles and practices which aim at the prevention and arrest of tuberculosis.

Tuberculin is now but little used in this country, but Dr. John R. Gillespie describes what he considers a "rational method" whereby it may be advantageously administered. Interesting tables of cases are given in his brochure.⁴

Many of our readers will be interested in a little volume of striking poems by Mr. John Ferguson, of Stirling. The work is now in its

¹ "Die Operative Behandlung der Lungentuberkulose," von Professor Dr. F. Jessen, Geheimer Sanitätsrat in Davos. Ss. 75 mit 11 Abbildungen im Text 1921.—"Die Partegengesetze und ihre Allgemeingültigkeit: Erkenntnisse, Ergebnisse, Erstrebnisse." Allgemeinverständlich dargestellt von Hans Much, Universitätsprofessor in Hamburg. Ss. 70 mit 2 Tafeln. Price, paper covers, M. 15.—"Taschenbuch der Knochen, und Gelenktuberkulose (Chirurgische Tuberkulose) mit einem Anhang: Die Tuberkulose des Ohres des Auges und der Haut: Ein Leitfad für den praktischen Arzt." Von Dr. H. Schwermann, Facharzt für Tuberkulose, Oberarzt am Sanatorium Schwarzwaldheim Schömburg-Neuenbürg. 10 Abbildungen im Text. Price, paper covers, M. 15.—"Einfache Hilfsmittel zur Ausführung bakteriologischer Untersuchungen." Von Geh. Medizinalrat Professor Dr. M. Ficker. Ss. 102, 1921. Price M. 18.—"Frühdiagnose der Lungentuberkulose unter Gleichzeitiger Berücksichtigung der Drüsen und Lungensymptome." Von Dr. Hanns Alexander, Chefarzt des Sanatoriums Seehof Davos. Dorf. Ss. 35. 1921. Price M. 12.—"Moderne Biologie in Einer Vortragsreihe Entwickelt." Von Dr. Hans Much, Professor an der Universität Hamburg. Ss. 31. 1921. Price M. 8. All the above six monographs are published by the firm of Curt Kabitzsch, Leipzig.

² "Practical Tuberculosis: A Book for the General Practitioner and those interested in Tuberculosis." By Herbert F. Gammons, M.D. Pp. 158. London: Henry Kimpton, 263, High Holborn, W.C. 1. 1921. Price 10s. 6d. net.

³ "The War on Tuberculosis." By A. F. Miller, M.D., and Jane W. Mortimer. Pp. 147. Halifax, N.S.: The Minister of Public Works and Mines. 1921.

⁴ "A Rational Method of using Tuberculin in the Treatment of Pulmonary Tuberculosis." By John R. Gillespie, M.A., M.D., B.Ch., B.A.S., D.P.H., Tuberculosis Medical Officer for County Down. Pp. 39. Belfast: Graham and Heslip, 41, Franklin Street. 1918. Price 2s. 6d. net.

seventh edition.¹ The chief feature is the sonnet-sequence, "Thyrea," which Mr. W. L. Courtney, in his sympathetic Introduction, tells us was written in a sanatorium. Doubtless many will be reminded of Henley's hospital poems, but Mr. Ferguson has a characteristic note of his own, and his work, while distinctly individualistic, is marked by real literary distinction. All of the "other sonnets" are of high merit. This little volume may well find a place in the pockets of doctors and patients, for it contains much that will sweeten and cheer life's adventures.

"The Medical Annual" is now in its thirty-ninth year, and fully maintains its high standard as an indispensable reference-book for busy practitioners anxious to keep up-to-date.² It is specially valuable as providing a critical estimation of new methods in diagnosis and fresh procedures in treatment. There are thirty-one contributors. Dr. Carey F. Coombs and Mr. A. Rendle Short have proved themselves most capable editors. Among the numerous articles are many references to Tuberculosis. Dr. O. C. Gruner deals with the Tubercle Bacilli in the Tissues; Dr. A. Latham epitomizes recent communications on Pulmonary Tuberculosis; Sir W. I. de C. Wheeler writes on Tuberculous Abscess; Dr. H. French refers to Tuberculosis of the Spleen; Dr. J. Burdon-Cooper describes the use of Tuberculin in Eye Lesions; Dr. E. Graham Little directs attention to the association of Erythema Nodosum and Tuberculosis, and the same writer has a helpful paper on the treatment of Lupus. There is a useful list of Sanatoria. Professor F. J. Charteris provides an excellent Dictionary of Remedies. Dr. C. Thurstan Holland furnishes a serviceable survey of Radiography, Radio-activity, and Electro-therapeutics. There are many articles of general interest, among which we would direct special attention to Dr. O. C. Gruner's contribution on the Chemistry of Blood; Dr. J. A. Nixon's summary of the Deficiency Diseases; Dr. Carey F. Coombs' epitome of Diseases of the Heart; Dr. J. A. Hadfield's presentation of Psychological Medicine; and Colonel L. W. Harrison's article on Syphilis. These few references will be sufficient to indicate that the work is one which must not be overlooked; it is, indeed, a volume which should always be within reach, ready for rapid consultation. The book is excellently got up and generously illustrated.

The new issue of the "Empire Municipal Directory and Year-Book" is another indispensable reference work for medical officers of health, tuberculosis officers, and medicals engaged in public health services.³ It provides a concise and complete guide to British and Colonial Corporations, and County, Urban, and Rural Councils, and there is an authoritative list of their chief officials. The work is, indeed, an encyclopædia of municipal, highway, and public health engineering. There are special articles relating to roads and road-making, lighting, heating, and ventilation, water supply, sewerage and sewage disposal, public cleansing, fire prevention, housing and town-planning, etc. The Diary section provides spaces for the record of notes, the register of engagements, and the like.

¹ "Thyrea and other Sonnets," by John Ferguson, with an Introduction by W. L. Courtney. Seventh edition (enlarged). Pp 46. London: Andrew Melrose, Ltd., 3, York Street, Covent Garden, W.C. 1920. Price 1s. 6d. net.

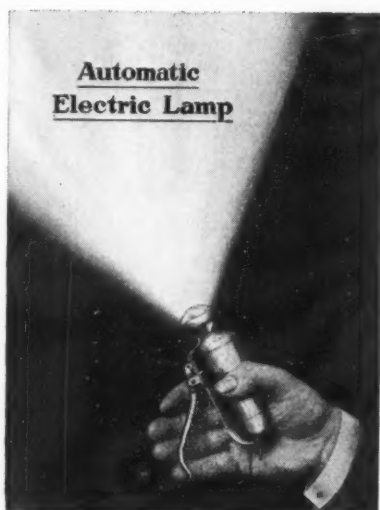
² "The Medical Annual: A Year-Book of Treatment and Practitioners' Index." Pp. cviii+616+147. Bristol: John Wright and Sons, Ltd. 1921. Price 20s. net.

³ "The Empire Municipal Directory of Local Authorities and Officials, and Year-Book of Municipal Engineering and the Sanitary Record for 1921-22." Thirty-ninth year of publication. London: The Sanitary Publishing Co., Ltd., 8, Breame's Buildings, E.C., 1921. Price 10s. 6d. net.

PREPARATIONS AND APPLIANCES.

THE AUTOMATIC ELECTRIC LAMP.

DOCTORS and nurses are among the people who find some form of electric lamp almost indispensable if they are to carry on their work



THE AUTOMATIC ELECTRIC LAMP.

under all circumstances, safely and effectively. Medical superintendents of sanatoria, industrial colonies, hospitals, etc., as well as all classes of medical officers in the public services and general practitioners in every part of the country, find an electric lamp an essential part of their equipment. But the ordinary form is too apt to fail when needed most. With the coming of the AUTOMATIC ELECTRIC LAMP we can now rely on a pocket companion which is always ready. No refills are wanted and in all climates and at every season it can be relied upon, for it is a self-generating lamp. By simple hand pressure on a lever a small dynamo is set in action and thereby a light can be maintained as long as it is required. The general

appearance of the lamp and its chief features are indicated in the accompanying illustration.¹

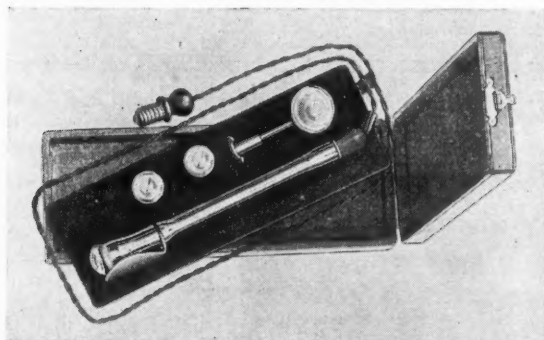
A NEW ELECTRIC LARYNGOSCOPE.

The Automatic Electric Lamp or "Electro Automate," as it is sometimes designated, described in the preceding paragraph, has now been arranged so that it can be employed for the production of a current which can be supplied for the service of a new ELECTRIC LARYNGOSCOPE.² The chief points in connection with this novelty are indicated in the accompanying illustration. The equipment includes angled concave laryngeal mirror, tongue depressor, three special magnifying bulb lamps, and an ebonite contact plug with wire attachment. All parts are silver-plated, and are contained in compact

¹ The Automatic Electric Lamp is supplied by Theo and Company, 6, Hatton Garden, Liverpool. Price £2 5s.

² The new Electric Laryngoscope is supplied by Theo and Company, 6, Hatton Garden, Liverpool. Price complete, with hand lamp and laryngoscope and accessories in case, 63s., post free.

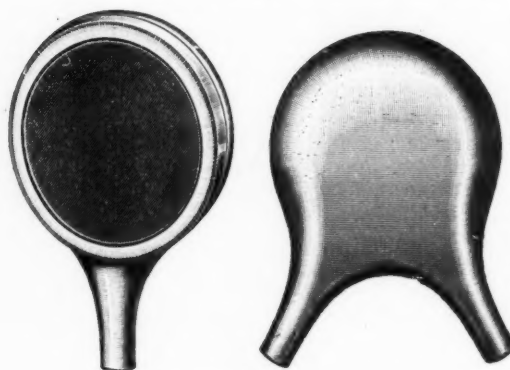
case for the pocket. This practical clinical novelty will be of special service not only to tuberculosis officers and physicians specially inter-



THE NEW ELECTRIC LARYNGOSCOPE.

ested in throat and laryngeal cases. It will also be of the greatest assistance to school medical officers and examiners in connection with insurance offices, as well as to all general practitioners.

A NEW STETHOSCOPE.



THE MINCHIN STETHOSCOPE.

Dr. William C. Minchin of Invicta House, Sheerness, has invented a new form of stethoscope.¹ The accompanying figures indicate something of the form of the chest-piece. The inventor claims for his novelty that it is of special service in the examination of bed patients and prostrate subjects who cannot be exposed

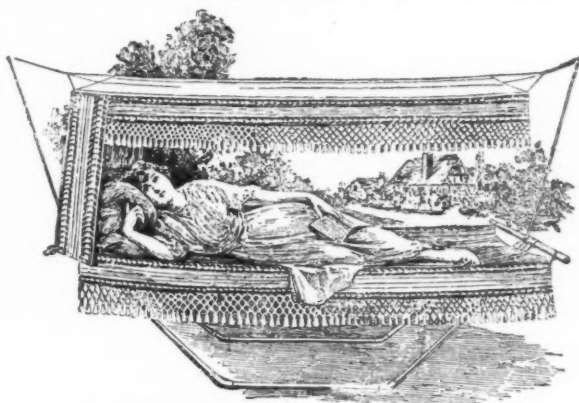
to a prolonged examination or much disturbance in position. The chest-piece is set at right angles, and can be introduced under clothing if necessary. The appliance is about the size of a lady's watch, and can easily be carried in the pocket. In heart cases the new stethoscope is likely to be of much assistance. Dr. Minchin points out that

¹ The Minchin Stethoscope is supplied by Eschmann Bros. and Walsh, 23 Bartholomew Square, Old Street, E.C. 1. Price of chest piece, 10s. 6d.

it is of particular service in listening for the foetal heart. He also directs attention to the advantage offered in the auscultation of the chest in children.

THE "GODDARD" PORTABLE HAMMOCK BED.

The accompanying illustration indicates the chief features of the "Goddard" PATENT PORTABLE HAMMOCK BED,¹ which is likely to be of much service in sanatoria and for all classes of patients requiring rest and restoration under open-air conditions. This hammock raises the patient well above the ground, is strong and stable, and readily



THE "GODDARD" PORTABLE HAMMOCK BED.

portable, and it is exceedingly comfortable. The hammock has its own collapsible stand made of strong steel tubing, thickly coated with aluminium to prevent rust. When packed it is only 3 feet long and weighs less than 20 lbs. When erected the stand is perfectly strong and rigid, and supports the hammock in such a way as to insure perfect rest for the occupant. The canopy is supported over the hammock by small steel rods which are ingeniously fitted into the frame, and the whole contrivance is independent of trees, poles, or any extraneous support. The hammock can also be supplied by the makers fitted with detachable wheels and axles, so that the convalescent may be easily moved about by an attendant. The hammock can also be easily carried by two persons, making a light and serviceable stretcher. For sanatorium work the makers have now designed a hammock similar to the one illustrated, but in plain green willerden canvas, which can be easily carbolised or disinfected. A flap is attached which can be drawn over the body of the patient to give additional protection in bad weather. The hammock bed can be provided in forms suitable for children and every class of adult. It can be obtained with rainproof cover and fittings, mosquito net, or in *De Luxe* form, with sun canopy. We have pleasure in recommending this extremely serviceable and up-to-date

¹ An illustrated booklet with full particulars can be obtained on application to the "Goddard" Patent Hammock Bed Co., 146-148, Borough High Street, S.E. 1.

hammock, which can be seen in use at the Children's Sanatorium of the National Children's Home and Orphanage, Harpenden, Herts.



THE "ANTAP-
SAL" NASAL
APPLIANCE.

HYGIENIC APPLIANCES AND THERAPEUTIC PREPARATIONS.

The "ANTAPSAL" NASAL APPLIANCE is a little contrivance for providing continuous application of medicated vapour to the nasal passages.¹ It can be worn within the nostrils without attracting attention, and in certain catarrhal and other cases appears to bring relief. Various medicaments can be used with the appliance. "Cataronol" and "Asbronatol" are special preparations now available, the former being advised for use in colds, hay fever, sore throat, influenza, etc., and the latter in chronic bronchitis and asthma.

ELIXIR CALCII CREOSOTI contains 5 per cent. of Beechwood Creosote in chemical combination with lime.² It is non-irritant, pleasant to the taste, and does not give rise to disagreeable repetition. Creosote is an agent of undoubted value in the treatment of many cases of tuberculosis, and this new concentrated aromatic elixir provides an excellent form for its administration.

COLLOSOL BROMOFORM CO. is a new member of the Collosol series prepared at the Crookes Laboratories.³ It is an elegant pharmaceutical preparation, which promises to be of much service in alleviating the cough which is so frequently a specially distressing feature of pulmonary tuberculosis. It contains half a minim of bromoform, $\frac{1}{10}$ of a grain of heroin hydrochloride, 1 grain of terpin hydrate in each drachm, together with the colloidal balsamic extracts of senega, wild cherry, and pine. In this preparation the danger of the bromoform becoming deposited owing to its heavy specific gravity and insolubility is obviated.

IODINOSOL⁴ is a new non-irritant, non-staining preparation of iodine. It is really a solution of iodine in a partly oxygenated mineral oil. Absorption is rapid, and it is claimed that it can be employed whenever potassium iodide is indicated. It is available in two strengths—6 per cent. and 10 per cent.

GUAIACOSOL⁵ is a preparation likely to be of service in certain cases of tuberculosis. It is a solution of guaiacol in a base specially selected to ensure rapid absorption. By inunction guaiacosol can be administered in increasing doses over long periods without the risk of gastric irritation.

¹ "Antapsal" outfits and all particulars can be obtained from the British "Antapsal" Co., Ltd., 38, Great Ormond Street, Southampton Row, W.C. 1.

² Elixir Calcii Creosoti is supplied by R. Sumner and Co., Ltd., 40, Hanover Street, Liverpool.

³ Full particulars regarding Collosol Bromoform Co. and the other Collosol preparations may be obtained on application to the British Colloids, Ltd., The Crookes Laboratories, 22, Chenies Street, Tottenham Court Road, W.C. 1.

⁴ Iodinosol is supplied by E. T. Pearson and Co., Ltd., London Road, Mitcham, Surrey.

⁵ Guaiacosol is manufactured by E. T. Pearson and Co., Ltd., Mitcham, Surrey.

LAXAMEL¹ is a semi-solid form of "Paroleine," a specially purified form of liquid paraffin, the valuable intestinal lubricant and corrector of constipation. It is an elegant jelly-like preparation containing approximately 80 per cent. of "Paroleine." It is attractive in appearance, has a pleasant aroma, and is very palatable. For many consumptives and other tuberculous cases both children and adults Laxamel will prove of much service.

The various Brand Nutrient Specialities² will be found to be of exceptional value in the treatment of tuberculous, tuberculously disposed, and other delicate subjects. We would particularly commend the following preparations: "Ferrocarnis" is an excellent hæmatinic; it is a pleasantly flavoured, well tolerated iron tonic with raw meat juice. It does not upset digestion or produce constipation, and the teeth are not tarnished. The pure "Meat Juice" is very valuable in acute, advanced, and debilitated cases. It is an admirable stimulant and much appreciated when given with aerated water, especially in hot weather. The special "Essences" of beef, chicken, etc., provide delicacies and nutrients of high merit, and such as should always be available for the needs of the sick and enfeebled.

The Apollinaris Company are now able to supply all demands for their well-known waters.³ "APOLLINARIS" is, as everyone knows, an excellent table water, and for many consumptives and other tuberculous subjects it provides an ideal drink. It is often of much service when mixed with hot or cold milk. "APENTA" is a useful aperient, which meets the needs of many patients who are the subjects of chronic constipation or require the assistance of a mild saline laxative.

Patients in hospital and sanatoria and indeed all who pursue an open-air life for health or happiness will find the elegant cosmetic and sanitary preparations made by the well-known firm of Dubarry et Cie of exceptional service.⁴ We would specially direct attention to the following: "Colonice," a solidified form of Eau de Cologne, cooling and restorative when applied to the forehead and face or other skin surfaces. "Eucalyptus Eau de Cologne," made by distilling Eau de Cologne in conjunction with eucalyptus, forms an excellent deodorant and disinfectant spray for the sick-room. "Flygo," as its name suggests, is a preparation which provides a protection against mosquitoes, flies, gnats, midges, and other insects. It is a solid, non-greasy application, which can be readily carried in the pocket in convenient stick form, and applied to the exposed skin when desired. "Glyntos Dental Cream" is a charming form of dentifrice put up in collapsible tubes. "Sanos Effervescent Mouth-Wash Tablets" are novel, convenient, hygienic agents for the ready preparation of effective cleansing of the mouth and throat. They furnish admirable means for the formation of a sparkling, refreshing, and antiseptic mouth-wash and gargle for the night and morning, before and after meals, and at all such other times as may be desirable.

¹ Full particulars regarding Laxamel can be obtained from the makers, Burroughs, Wellcome, and Co., Snow Hill Buildings, E.C. 1.

² An illustrated price list of the Brand Preparations can be obtained on application to Brand and Co., Ltd., Mayfair Works, 72-84, South Lambeth Road, Vauxhall, S.W. 8.

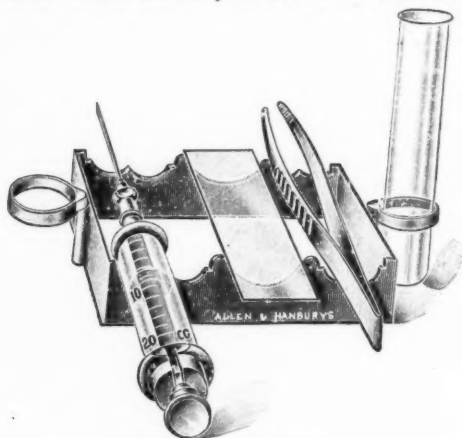
³ Full particulars regarding "Apollinaris" and "Apenta" can be obtained on application from the Apollinaris Company, 4, Stratford Place, Oxford Street, W. 1.

⁴ Particulars regarding all the Dubarry preparations may be obtained on application to the London headquarters, Dubarry et Cie, 81, Brompton Road, S.W.

SANITARY NOVELTIES FOR THE SANATORIUM,
HOSPITAL, OR HOME.

The SUMNER FOLDING LEG REST¹ is a simple, yet very effective, contrivance whereby a patient on any ordinary chair can be provided with support for the lower limb. It is strong, portable, cheap, and cannot easily get out of order. When not in use it folds up, and so can readily be packed in a trunk or hold-all for travelling. For use in the hospital, sanatorium, nursing-home, or private house this novelty only needs to be used to be appreciated.

Lieutenant-Colonel Gunter, Assistant Physician to the Margaret Street Hospital for Consumption, has designed a special TRAY, the chief features of which are fully indicated in the following figure.²



THE GUNTER TRAY.

It will prove a useful assistant in the conduct of work, not only in the laboratory, but in clinical service in the dispensary, hospital, or elsewhere. Many of our readers will welcome this novelty, as it meets a real need in a simple but effective manner.

FLAMMOIDS³ is a portable substitute for methylated spirit, and will be much appreciated by those who live an open-air life or are accustomed to travel. It is estimated that one "Flammoid" will heat eight ounces of milk. All that is necessary is to place the "Flammoid" on a tile and apply a lighted match.

THE "JIGGER" POCKET KNIFE⁴ is a novelty which will be appreciated by sanatorium patients and all others living an active and open-air

¹ Full particulars regarding the Sumner Folding Leg Rest can be obtained on application to R. Sumner and Co., Ltd., 40, Hanover Street, Liverpool. The price is 12s. 6d.

² The Gunter Tray is supplied by Allen and Hanbury, Ltd., 48, Wigmore Street, Cavendish Square, W. 1.

³ "Flammoids" are supplied by Dubarry et Cie, 81, Brompton Road, S.W. 3.

⁴ The "Jigger" Pocket Knife is supplied by Watson, Son, and Co., Bassishaw House, 70A, Basinghall Street, E.C. 2. Price 2s. 6d.

life. It is an ingenious contrivance for employing old safety-razor blades, and provides for the maintenance of a permanently sharp knife, which in home or hospital, school, office, or workshop, can be depended upon as a reliable cutting tool. The "Jigger" can be employed for all forms of cutting; it can also be used for many and varied purposes, such as sharpening pencils, cutting cigars, string, corns, etc.; a nail file or match striker, opening crown cork bottles, hair trimming, and even as an emergency razor. Patients will find a "Jigger" an indispensable pocket companion. It will make an ideal present for boy scouts and girl guides.

Under the designation of the *ASTRAL INTENSIFIER*¹ there has been introduced a new form of self-adjusting shade which can be fitted to any existing electric lamp, and which it is claimed increases illumination and is generally efficient and economical.

As a time and labour saving contrivance, inexpensive to procure and economic to use, the Keith Patent Domestic GAS IRON² deserves a wide popularity, not only in the home, but in hospitals and sanatoria. The iron weighs 5 lbs., and consumes gas at the rate of 3 cubic feet per hour. There is an absence of smell and noise, and there is neither sooting up nor lighting back. The iron is nickel-plated, is fitted with adjustable nipple, and can be attached to a flexible metallic tubing, to which there is a rubber push-on at each end. This effective iron is constructed on sound scientific lines and in accordance with engineering principles, and only needs to be used to be enthusiastically approved.

The well-known firm of Libraco Limited have introduced many time and labour saving contrivances for office equipment, some of which doctors in public services as well as in private practice have found of the greatest assistance in the organization and conduct of their work. A neat, novel, and effective companion for the desk will be found in the so-called *WORK ORGANISER*.³ It consists of a ten-pockets case, each department having a definite label. This enables incoming letters and outgoing communications, clinical notes, official records, charts and reports, schemes, lecture notes, etc., to be gathered together in convenient order, and found at a moment's notice. We believe that tuberculosis officers and others in the public health services, secretaries of hospitals, and the like, editors, and men and women generally engaged in literary, journalistic, professional, and business activities, will find their day's work much facilitated by the use of this aid to organised service.

¹ The Astral Intensifier is supplied by Overseas Contracts, Ltd., Commercial House, 72-84, Oxford Street, W. 1. Price 3s. 6d.

² The Keith Patent Domestic Gas Iron is manufactured by James Keith and Blackman Co., Ltd., 27, Farringdon Avenue, E.C. 4, from whom all particulars can be obtained. The price is 10s.

³ The Work Organiser is supplied by Libraco Limited, 62, Cannon Street, E.C. 4. Prices, 5s. 9d. to 25s., according to form and size.

THE OUTLOOK.

TUBERCULOSIS AND EX-SERVICE MEN.

In the spring of last year the Director of the Medical Services of the Department of Soldiers' Civil Re-establishment appointed a Board of representative Tuberculosis Sanatorium Consultants to study in general the whole question of the treatment of tuberculosis occurring amongst the ex-members of the Canadian and Imperial forces in Canada. The greatest liberty of investigation was afforded. Business details were not specified as part of the inquiry, but special reports were to be made in detail on the several sanatoria regarding: (1) The suitability, sufficiency, and efficiency of the plant in general, and its equipment and furnishings. (2) The personnel in general, and especially the medical personnel as regards special training and experience in the diagnosis and treatment of tuberculosis. (3) Medical standards and records as regards method and efficiency. (4) Conclusions regarding patients examined by the board: (a) Patients who have been under treatment for a longer period than five months, with a view to determining whether the department is justified in retaining them longer in the sanatorium for treatment. (b) Patients of uncertain diagnosis, or those under treatment for conditions other than pulmonary tuberculosis, but who, in the judgment of the medical superintendent, require prolonged sanatorium treatment. (c) Any special cases for whom a medical superintendent required consultation. (d) All patients in whom poison gas may have been a factor in producing illness (especially those with official histories of exposure), with a view to determining the etiological association of the exposure with the condition for which the patient is being treated. (5) The quality, source of supply, preparation, and service of the food. (6) Complaints which, without prejudice, may have been brought forward by patients, staff, or employees, individually or assembled, by the invitation of the Board. These to be forwarded to the Director Medical Services with comments and recommendations. (7) Recommendations as to: (a) Necessary or desirable additions to, or alterations of, plant and equipment, especially in regard to improvement of medical facilities—viz., artificial pneumothorax apparatus, X-ray department, laboratory, dental department, provision for natural or artificial sunlight, hydrotherapeutic arrangements, desirable development of a medical library, occupational therapy, and vocational training. (b) Improvements of medical standards and records. (c) Modifications of service and policy. (d) Concentration of patients wherever practicable, with the closing of unnecessary or less efficient sanatoria. In addition to the care of patients under treatment, the general question of the after-care and employment after discharge from the sanatorium of the tuberculous ex-service man was to be given consideration. A summary of the report has recently been issued. The 8,571 so-called tuberculous ex-service men treated by the department to April 30, 1920, when proportioned to the 590,572 men entered in the C.E.F., give an incidence rate of 2.5 per 1,000 yearly for the 5½ years considered.

This is designated the crude incidence rate. The average number of men under arms throughout the period of the war, with deductions for dead and missing, has been estimated at 317,000. The annual incidence rate is, therefore, more fairly based upon this number, and is 4.7 per 1,000. Since 8.6 per cent. of the patients treated in sanatoria were diagnosed as non-tuberculous, 0.4 per 1,000 should be deducted, leaving 4.3 per 1,000 as tuberculous. These are further divided into bacillary positive cases, 1.9 per 1,000 (44 per cent.), and clinically tuberculous cases, 2.4 per 1,000. This rate of 4.3 is termed the corrected incidence rate. The incidence rate of tuberculosis in the British forces, obtained by proportioning the total cases to total enlistments, without correction for the annual average under arms, is 1.07 per 1,000 yearly. It is understood that in Great Britain the presence of bacilli was necessary for a diagnosis of tuberculosis; so that, instead of comparing the rate of 2.5 per 1,000, similarly obtained for the C.E.F., with the British rate, the crude rate for bacillary positive cases only should be used, 1.1 per 1,000 (44 per cent. of the 2.5 crude rate). The incidence rate is, therefore, approximately the same in the two armies; but in Canada 1.4 per 1,000 have been treated in addition as being probably tuberculous. The rejections for tuberculosis from the first million men drafted into the American Army were 8.73 per 1,000—more than six times the death-rate estimated for men of military age in Canada. This was quite a non-selective draft, and many cases of active tuberculosis were necessarily included. The break-down rate during service (incidence) was 2.9 per 1,000, rather more than the probable comparable incidence (2.5) of the C.E.F. A comparison between the incidence of tuberculosis in the army and in civil life, while of interest and importance, may only be approximated. Too short a time has elapsed for the death-rate from tuberculosis in the army to become reliable for comparison with the civilian death-rate. The civilian death-rate is the only index of the amount of tuberculous disease in the community at large; and, by multiplying this by various factors, estimates have been made of the morbidity or tuberculous status of the community existing at any one time. It is fallacious, however, to compare this momentary status with the annual incidence or crop of tuberculosis yielded by the army, removed from it, and placed in sanatoria. The civilian incidence is that amount of new tuberculosis which yearly enters the tuberculous group to replace losses by death and recovery, absolute or relative. The civilian incidence, with some variation, has long been operating to evolve the tuberculous group. It can be shown that, operating for a period of twenty years, an annual incidence of twice the death-rate will compensate losses by death, maintain an average number of five times the death-rate of clinically active cases, a group of equal size of less obviously active cases, and a group of arrested cases ten times as large as the death-rate. Two-thirds of this group of arrested cases (16 per cent. of the incidence) will not die from tuberculosis within the period. This last group is fairly comparable with the 25 per cent. of patients who do not die from tuberculosis within twenty years after discharge from the Trudeau Sanatorium (Trudeau Sanatorium analysis). After the twenty-year period, this status will be maintained by an incidence rate one-third greater than the death-rate. Thus, the several estimates of the relation of morbidity to mortality, the results of approximations or surveys, can be satisfied. In Canada, the death-

rate from tuberculosis in 1915 was 1.08 per 1,000 for the whole population. For men of military age, the rate has been estimated at 1.36 per 1,000 for the whole country from incomplete vital statistics. This group had a rate of 1.06 per 1,000 in the provinces of Alberta, Saskatchewan, Manitoba, and Ontario. The general rate for these four provinces was 0.84. This relatively more vigorous population provided 66 per cent. of the enlistments. It would seem that, broadly speaking, there has been twice as much tuberculosis amongst the ex-service men of the C.E.F. as amongst civilians of the same age period (20-44). Much interesting information is given regarding cases which had undergone sanatorium treatment. With regard to difficulties in diagnosis, it is shown that the war, with its aftermath of chronic respiratory infections amongst ex-service men, requires of the sanatorium physician a more accurate differentiation of pulmonary diseases than formerly obtained. The safe and easy course before the war was to regard an indefinite lung affection as tuberculosis unless there was strong evidence to the contrary. The recognition to-day of various chronic respiratory infections impairing health, suggestive but not typical of tuberculosis, introduces a very great difficulty in appreciating fairly the condition of a patient in whom there is reason also to suspect a present or past tuberculous affection. The physician may use all modern means of diagnosis for his suspect cases, and still have reason to doubt the rightness of his conclusions, although for pension requirements he must make a decision. Doubtful and non-tuberculous cases formed 17 per cent. of all admissions of D.S.C.R. patients. A number of sanatorium physicians were at a loss in placing these patients, although all facilities for intensive differential diagnosis were at hand. Sometimes they were confused because of the point of view of consultants and of the Pensions Board examiners, especially in regard to patients manifesting a latent clinical tuberculosis, but with a complicating affection. It would be helpful if standards of diagnosis were formulated which, while demanding a minimum of research, would compel accurate deductions before reaching a diagnosis. A class for cases of doubtful evidence, while needed, is a temptation to inaccurate diagnosis. The classifications used for sanatorium purposes, carefully defined, but necessarily arbitrary, have distinct limitations which have been severely strained by these recently-added difficulties in diagnosis. The necessity of some modification is obvious, which will include, but still differentiate, those cases here designated as having latent clinical tuberculosis. This type of case peculiarly complicates the classification of degree of disease and the result of treatment in sanatoria. The patient gives evidence of a past tuberculosis, which is confirmed by X-ray examination; but the disease may be quite arrested, cause no symptoms, and bear no relation to the present illness from which the patient suffers. Nevertheless, it cannot be disregarded as a possible factor in the present illness until a period of observation by a competent observer has made possible a decision in regard to its neutrality. Such cases, of which there are many admitted to sanatoria, should not properly be classified amongst the actively tuberculous, nor should the sanatorium be credited for effecting an arrest of an inactive and probably healed condition not responsible for the illness of the patient. This Board has taken the opportunity afforded by collecting statistical material of attempting to modify existing classification in order that the

latent clinical group may be differentiated. With regard to disciplinary difficulties, it is interesting to note that they are less frequent now than during the earlier years when military life was nearer. While relatively few in number, they are, however, more or less general wherever any considerable number of ex-service men are in residence, and their frequency depends largely upon environment. Some sanatoria were, unfortunately, too accessible to towns. Sanatoria at a considerable distance from a centre of population, and well beyond easy walking distance from a town, are more fortunate. Then the visiting of friends is limited, and cost of travel stands in the way of applications for leave. Leave in a sanatorium is not to be demanded as a matter of right, since it seriously interferes with treatment, but should be for cause only. The right idea in regard to the treatment of tuberculosis, which is all-important (to the patient), is probably more easily obtained and sustained in those sanatoria which also treat civilians than in those treating only ex-service men. Moreover, the civilians indirectly influence the point of view of the ex-service men in other matters, and help to link them again to civilian conditions and the problems which lie before them after discharge. It is quite natural that ex-service men in general should have proved less amenable to the restrictions of sanatorium life than civilians, although identical methods are required to obtain the best results. A majority conform quite as well as the average, and some even as well as the best, of civilian patients, but that a minority are decidedly more difficult to treat has been the experience of all sanatorium physicians. Discipline in relation to treatment is all-important, and infringement of it the greatest handicap to the individual patient and to the patient body as a whole. A definite line should be drawn in regard to infringements of discipline; trespassing beyond this by a patient should constitute refusal to take treatment, followed by withdrawal of support and cessation of responsibility by the department. The report also contains an important section on the care of the tuberculous ex-service man after discharge from sanatorium. The whole report is of exceptional interest, and we learn from Dr. W. C. Arnold, the Director of the Medical Services, that a copy of the summary will be sent to any medical adviser on application.

VENTILATION AND OPEN-AIR TREATMENT.

The Medical Research Council have issued two volumes of a report prepared by Dr. Leonard Hill on "The Science of Ventilation and Open-Air Treatment." It is a masterly study of scientific principles applied to practical measures having far-reaching influence on the prevention and arrest of tuberculosis and certain other morbid states impairing health and lessening efficiency. Such a suggestive work demands the consideration of all students of tuberculosis problems.¹ The work opens with studies on the Cooling Power of the Atmosphere and its Measurement by the Kata Thermometer; the Relation of the

¹ "The Science of Ventilation and Open-Air Treatment." By Leonard Hill, M.B., F.R.S., Director of the Department of Applied Physiology of the Medical Research Council. Part I., pp. 249, with xciv. tables and 82 figs. and charts. Part II., pp. 295, with xxiv. tables and 52 figs. and charts. Nos. 32 and 52 of Special Report Series. Issued by the National Research Council of the Privy Council, and published by His Majesty's Stationery Office, Imperial House, Kingsway, W.C. 2. 1919 and 1920. Price 10s. each volume.

Kata-Thermometer Cooling Power to Heat Loss of Man in Baths and in Still or Moving Air; the Conductivity of the Skin and Heat Loss in Relation to Surface and Deep Temperature; Metabolism and Cooling Power; the Evaporative Power of the Atmosphere and its Influence on Heat Loss; the Influence of the Atmospheric Environment on the Respiratory Membrane; and these are followed by a series of records of special observations. Then in Part II. appear elaborate studies on Radiation; the Percolation and Action of Light on Living Organisms; the Colour of the Skin and Racial Adaptation to Climate, and the Emission, Absorption, and Reflection of Light by White and Black Skins; the Influence of Sunlight on Transpiration of Wet, Black, and White Surfaces; Sunlight in Tropical and Temperate Climates; Black Fur, Cheek, and Clothes Surface Temperatures; Acclimatization to Insolation; Body and Skin Temperature in the Tropics and the Effect of Exercise and Sweating; Heat Stroke; and Food, Exercise, and Climate. Then follow sections dealing with the Chemical Purity of the Atmosphere in Crowded Confined Places and in Mines; the Smoke Nuisance and the Economic Use of Coal; Dust; Heat Stagnation and Fitness; Health and Environment; Fever and Open-Air Treatment; Treatment at High Alpine Altitudes; Clothes; and Methods of Ventilation and Heating. Such an enumeration is sufficient to indicate the importance and far-extending practical interest of these two official volumes. We would particularly commend the section on sanatorium treatment to all tuberculosis officers and medical superintendents of these institutions. We venture on a few selected quotations: "The open-air treatment of phthisical patients requires to be based on physiological principles, not on a blind belief in the virtues of open air. The patient needs the conditions which will most promote his health and happiness; he does not want to be chilled and made miserable. The first essential in treatment is a cheerful environment, giving present content and hope of future cure. . . . It is as unreasonable to expose a debilitated fevered patient in wet, cold, windy weather as it is to shut him up in the overheated still air of a room. It is as absurd to make a consumptive sit in his damp clothes after a walk in the rain as it is to prevent him taking exercise in the rain. . . . The ideal conditions out of doors are sun to promote the feeling of comfort and happiness, a gentle cooling breeze to promote adequate cooling of the skin and stimulate the metabolism of the body, coolness and low vapour tension of air to promote evaporation of water from and blood-flow through the respiratory membrane. . . . The greatest care should be taken to prevent overheating the patient by the sun. . . . Sanatoria should be placed where there is the driest soil, and the most hours of genial, bracing, sunny weather can be obtained. . . . Of very great importance is the wise discipline of the daily life of the patients at a sanatorium. . . . To secure a cheerful mind in the consumptive patient is of first importance." All this is excellent, and there is much else equally good.

NOTES AND RECORDS.

In Dr. Hamer's recently issued Report as Medical Officer to the London County Council there are data of much interest regarding tuberculosis. Among the Appendices is a special and very full Report by Dr. F. N. Kay Menzies on Arrangements for the Treatment of

Tuberculosis in London, together with diagrams and other communications on the subject. All interested in the prevention and arrest of tuberculosis in the metropolis should thoroughly study this official document.¹

The American Tuberculosis Association has issued a fifth edition of the Directory to tuberculosis work in the United States.²

There has recently been issued an official List (No. 10) of Sanatoria approved by the Ministry of Health.³ This List supersedes the issue dated November 19, 1919 (Circular 29).

The December issue of the *Indian Medical Record* was a "Special Tuberculosis Number," and contained a prize essay on "Tuberculosis: Ætiology, Prophylaxis, and Treatment," by Dr. Rajendra Kumar Sen. Articles are also contributed by Dr. P. Murugesan, Dr. Niven Robertson, Dr. P. C. Varrier-Jones, Dr. F. R. Walters, Dr. R. C. Roy, Dr. H. R. Harrower, and the Editor of this journal.⁴

A post-graduate course on orthopædics will be held at the Orthopædic Institute of Berck-sur-Mer (Pas-de-Calais) from August 1 to 8. The fee will be 150 francs. Particulars may be obtained from Dr. Foche, Institut Calot, Berck, or Clinique Calot, 69, Quai d'Orsay, Paris.

Dr. A. Rollier informs us that he has made arrangements for the conduct of a clinical course of lectures and demonstrations on heliotherapy at Leysin from August 16 to 20. An invitation to attend will be sent to any medical man or woman expecting to be in Switzerland at this time. The course will be taken by Dr. Rollier and his colleagues, Drs. Rosselet, Schmid, Amstad, Wenba, Alexandrowski, Miéville, and Granque. The programme is an exceptionally attractive one. Applications should be addressed to the Secrétariat Médicale du Dr. Rollier, Leysin, Switzerland.

Particulars regarding the forthcoming International Conference on Tuberculosis will be found on p. 122 of the present issue of this journal. The Conference will be held at the Institute of Civil Engineers, Westminster, from July 26 to 28, and over 100 delegates from other countries have already announced their intention of being present. Mr. Léon Bourgeois, President of the French Senate, will be in the chair, and among those who have accepted invitations are Sir George Newman, Sir Robert Philip (President-Elect), Sir Humphry Rolleston, Hon. Sir Arthur Stanley, Sir StClair Thomson, Professor Sir German Sims Woodhead, Mr. Woolcombe, and Sir William Younger, Great Britain; Professor Calmette, Assistant Director of the Pasteur Institute, Dr.

¹ "London County Council: Annual Report of the Council, 1915-1919, Vol. III. Public Health (including the Report for the year 1919 of the County Medical Officer of Health and School Medical Officer, Main Drainage, and Housing)." Pp. lxxviii+125. London: P. S. King and Son, Ltd., 2 and 4, Great Smith Street, Victoria Street, Westminster, S.W. 1. 1921. Price 2s. 6d.

² "A Directory of Sanatoria Hospitals and Day Camps for the Treatment of Tuberculosis in the United States." Compiled by the National Tuberculosis Association. Pp. 99. [Pamphlet No. 111.] New York: 381, Fourth Avenue. Price 50 cents.

³ "List of Sanatoria and other Residential Institutions approved by the Minister of Health for the treatment of persons suffering from Tuberculosis, and resident in England and Wales, with the names of the Administrative Counties and County Boroughs in which the Institutions are situate, and the date on which the approval expires in each case." Pp. 16. [List 10.] London: H.M. Stationery Office, Imperial House, Kingsway, W.C. 2. 1921. Price 3d. net.

⁴ The *Indian Medical Record* is published by A. C. Bishard, 2, Hovokumar Tagore Square, Corporation Street, Calcutta. The English agents are Messrs. Baillière, Tindall and Co. The annual subscription is 16s. The price of the Special Tuberculosis Number is Rs. 2.

Armand Delille, Granchier Institute, and Professor Léon Bernard, Hon. Secretary International Union, France; Colonel Bushnell, head of the Medical Department of the U.S.A. Army; Dr. Hatfield, Managing Director of the National Association of the U.S.A.; Dr. Linsley Williams, Dr. H. Landis, Miss Mary Gardner, Dr. Gerald Webb, and Dr. Charles Minor, United States; Professor Ascoli and Professor Pio Foa, Italy; Professor Harbitz, one of the leading authorities in Europe, Norway; H.E. the Chamberlain to the King, Sweden; Professor Nolen, Holland; Dr. Dewez, President of the Belgian National League against Tuberculosis, and Dr. Gaston Gregoire, Governor of Liège, Belgium; Dr. Siah, China; and Professor Winslow, League of Red Cross Societies. Delegates are also coming from Australia, Canada, South Africa, India, New Zealand, Denmark, Czechoslovakia, Greece, Argentina, Brazil, Spain, Roumania, the Republic of Columbia, Guatemala, Luxemburg, Haiti, Monaco, and Panama. Lord Curzon and Sir Alfred Mond, Minister of Health, will welcome the Conference on behalf of the Government. In addition to the features already announced, Dr. Armand Delille, of Paris, will give an address on "The Protection of Children against Tuberculosis, with special reference to the Grancher System." Arrangements are being made for visits to various special institutions. Full particulars can be obtained on application to the Conference offices at 20, Hanover Square, W. 1.

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